ELECTRICAL REVIEW

Managing Editor: HUGH S. POCOCK, M.I.E.E.
Technical Editor: C. O. BRETTELLE, M.I.E.E.
Industrial Editor: J. H. COSENS

30th January, 1948

Contents

EDITORIAL—Healthy Export Trade . . 151

ARTICLES—
- Light Metals Cold Rolling . . . 153
- Overseas Electrical Trade . . . 165

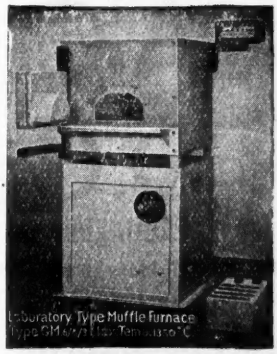
REPORTS—
- The Gas Bill 156
- French Electrical Construction . . 156
- Divisional Controllers . . . 163
- Coal Classification 164
- Lighting in Coal Mines . . . 167
- Batti-Wallahs' Society . . . 168
- Pit to Power Station 168
- Fuel Economy Display 168
- Gauge and Tool Exhibition . . . 170
- Marine Echo Sounding . . . 176

NEWS SECTIONS—
Personal and Social, 159; Commerce and Industry, 171; Parliamentary, 175; Electricity Supply, 177; Financial, 180; Contracts, 187.

VIEWS ON THE NEWS . . . 157
NEW BOOKS 158
CORRESPONDENCE 169
RECENT INTRODUCTIONS . . 179
NEXT WEEK'S EVENTS . . . 184
NEW PATENTS 185

Classified Advertisements 63
Index to Advertisers 78

EDITORIAL ADVERTISING & PUBLISHING OFFICES: Dorset House, Stamford St., London, S.E.1
Telegraphic Address: "Elecrev, Sedist, London." Code: ABC. Telephone No.: Waterloo 3333 (60 lines).
Annual Subscription, Post free: Great Britain and elsewhere £2 9s. 6d. Cheques and Postal Orders (on Chief Office, London) to be made payable to ELECTRICAL REVIEW LTD., and crossed "Lloyds Bank."
Entered as Second Class Matter at the New York, U.S.A., Post Office.



Electric Furnaces

FOR INDUSTRIAL AND LABORATORY PURPOSES

All Types are made by

SIEMENS-SCHUCKERT
(GREAT BRITAIN)

Telephone: EALing 1171-5
Offices — London, Birmingham, Cardiff, Glasgow, Manchester, Newcastle & Sheffield.

LTD

Grams: Siemensdyn, Brentford
Also representation in Australia, New Zealand, India and South Africa.

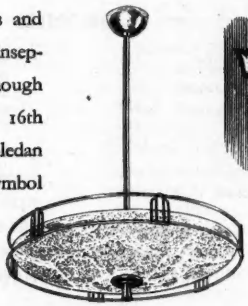
GREAT WEST ROAD
BRENTFORD
MIDDLESEX

Smee's S 4

Famous Hallmarks No. 6

The Swordsmiths of Toledo

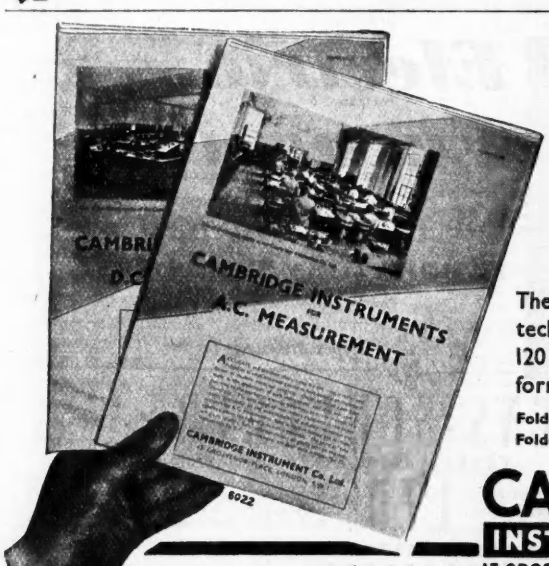
In the history of arms and armour the city of Toledo is inseparably linked with the sword. Though its absolute heyday was the 16th century, the mark of the Toledan swordsmith has been a symbol of superlative craft since the first century B.C.



FITTING No.
B.E. 5309

Berry's . . . HALLMARK FOR THE HOME . . .

Touchbutton House, Newman St., London, W.1



A.C.
and
D.C.
MEASUREMENTS

These two folders give concise technical data of more than 120 electrical instruments, and form handy reference sheets.

Folder 53-x describes D.C. instruments.
Folder 54-x describes A.C. instruments

CAMBRIDGE
INSTRUMENT CO. LTD.
13 GROSVENOR PLACE, LONDON, S.W.1
WORKS: LONDON & CAMBRIDGE

ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXLII. No. 3662 30th JANUARY, 1948 9d. WEEKLY

Healthy Export Trade

Electrical Manufacturers and Their "Targets"

NEARLY two years ago, in its report for 1945, the Council of the British Electrical and Allied Manufacturers' Association said that if the electrical manufacturing industry was to reach the general target figure suggested for this country's exports it would be necessary to raise electrical exports to £65 million a year (i.e., £5·4 million a month) for the next few years. Already towards the end of 1946 the monthly total was running at something like this figure, although the total for that year was only about £52·4 million. The word "only" is perhaps misleading for the 1946 total was nearly twice that for 1945.

However, the £65 million mark was well passed last year. As the figures given in this issue (p. 165) show, the total value of exports of electrical goods and machinery (including vacuum cleaners and other portable motor-operated appliances) was £74·3 million. (This, it may be said, was about three and a half times the 1938 export value.) Only in three months did the figure fall below the 1945 "target" of £5·4 million.

Ahead of Programme

Since 1945 new targets have been set up and Sir Stafford Cripps has specified what is expected from each branch of the industry. Under this new arrangement the overall monthly figure aimed at is about £7·0 million by the end of 1948. In three months of the past year that total was exceeded; the average for the latter half of the year was almost exactly £7·0 million per month.

Thus the stipulated figure for the end of this year has already been attained a year in advance. But it has to be remembered that we are dealing with ever-rising costs and prices, so the maintenance of the actual volume of exports necessitates an upward adjustment of the target figure. What this should be is uncertain in view of currency devaluation rumours and other unpredictable possibilities.

Hard-Currency Markets

Another aspect of our overseas trade is its dollar-earning capacity. It is the fact that the principal "hard currency" countries have large and efficient electrical manufacturing industries of their own. Consequently we cannot hope to do a great deal of direct electrical business with them. Actually in 1947 we supplied electrical goods and apparatus to Sweden and Switzerland to about eight times the 1938 value, and shipments to Portugal were ten times the 1938 figure. Argentina took two and a half times as much, and Canada three times. Electrical exports to the United States went up by 50 per cent in value, but this means that the volume was less.

But the most important was South Africa, our second largest customer, whose purchases in 1947 were valued at £9·3 million, as compared with £4·2 million in 1938. Our main hope of improving the industry's dollar-earning capacity lies very largely in South America and the 1947 statistics show an upward trend of trade with the leading countries of that Continent. The trade with European hard

currency countries is unlikely to remain at present levels.

Upon the whole, the state of electrical export trade is very healthy, but the maintenance of that health is largely in the hands of our own Government and those of other countries. The Ministries concerned should ensure that labour and materials are available in the needed quantities, while the Foreign Office and Board of Trade must exercise the greatest possible commercial diplomacy.

Summer "Staggering"

It seems that the Electricity Sub-Committee of the Joint Consultative Committee is considering the question of "staggered" hours in industry during the summer. There is no doubt that industrialists would be glad to secure relief from a system which has resulted in much trouble and expense and the need for it in summer will either disappear or greatly diminish. It is certain that the system would have to be reintroduced next winter and, once again, all the necessary complicated adjustments in transport services and other directions would have to be made. The Committee will have to weigh these considerations against one another. From the electricity supply aspect it may be said that a substantial reduction in demand in the summer would permit a greater measure of overhaul of plant which badly needs it.

Gas Nationalization

While the financial provisions of the new Gas Bill are similar to those of the 1947 Electricity Act, the organization which is to be set up varies in some important respects. The most prominent is the relationship between the proposed Gas Council and the twelve Area Boards which is very different in character from that between the British Electricity Authority and the Area Electricity Boards. This presumably arises from the great differences in "generation" which characterize the two industries. The national grid formed a natural background for a fully co-ordinated system; gas undertakings, though grouped, and though there are local "grids," have not been amenable to such an arrangement. The Gas Council, composed mainly of the Area Board chairmen, has advisory functions only, except in certain circumstances. Although it is hoped that, in distribution and sales matters, Area Electricity Boards will be autonomous, the Electricity Act is not so definite on the point as the Gas Bill. Other features of the Bill closely follow the electrical precedent.

Transformers

The large proportion of transformer failures caused by lightning, even in this country, makes an understanding of surge-stress distribution highly desirable, but the abstruse nature of the subject makes it difficult to grasp. Hence the value of the service to engineers by Mr. E. T. Norris in his I.E.E. paper last week, in which he gave a practical interpretation of recent developments in knowledge relating to the non-uniformity of initial distribution of surge-stress in the windings. There is more than one way of approaching the problem of increasing surge strength, but those who took part in the discussion were agreed that the former usefulness of B.S.422 had succumbed to events and that purchasers should be content with guaranteed impulse strength, leaving it to designers to devise ways and means of bringing this about.

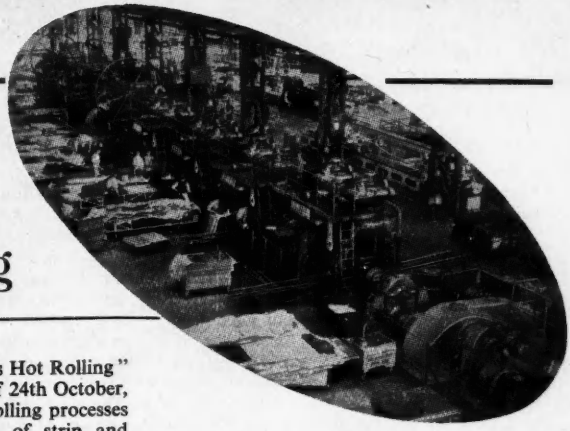
Contactors

A similar need to throw the onus on to manufacturers of producing designs that meet plainly stated requirements of users was implicit in Mr. B. Feldbauer's paper on contactors, the more so because the relevant B.S. are considered by many to be now obsolete. The large number of types in use indicates the difficulty of standardization to meet the diverse conditions (especially frequency of operation) found in industrial applications. The chief factors deciding survival are probably ease of maintenance and ability to prevent undisciplined zeal interfering with effectiveness of operation and shortening the life of components.

Divisional Controllers

The latest batch of appointments to the new electricity supply organization covers the divisions which have been made for the purposes of generation and main transmission. These are co-terminous with the fourteen areas. The list of divisional controllers includes a high proportion (six) of Central Electricity Board engineers, which is, of course, appropriate. Of the others a further six are municipal engineers and only two are company men. All of the new controllers are well known and form a good team.

Light Metals Cold Rolling



IN the article "Light Metals Hot Rolling" in the *Electrical Review* of 24th October, 1947, we dealt with the hot rolling processes employed in the production of strip and sheet from "Birmabright" magnesium-aluminium and other aluminium alloys at the Birmingham factory of Birmetals, Ltd. The major hot rolling processes are those centred around the breaking-down mill and include the reductions from the cast slabs to final thicknesses of about $\frac{3}{16}$ in. (0·476 cm) and cutting into strips and blanks. Many of the works products, however, require further reductions, and these are effected by cold rolling. It is, therefore, the purpose of this article to describe the electrical applications to these cold processes and allied operations which result in strip and sheet constituting the raw materials for other factories for the production of wares of all descriptions, largely by pressing operations.

Manufacture of Strip and Sheet

Annealing Strip Coils

Coils for strip rolling are usually annealed before being rolled and at various points throughout the rolling process, dependent upon final gauges and types of alloys being rolled. The annealing operation is carried out in either an "Efco" or a Siemens circular pit annealing furnace, which are similar in design, each having a two-tier loading deck which is placed in the furnace by means of an overhead crane. The furnace is then sealed by closing a horizontal sliding door which is manually operated. Each furnace is rated at 85 kW with a maximum temperature setting of 533 deg C.

The first rolling operation is preceded by a de-coiling operation carried out on a reversible three-roll coiler and de-coiler driven by a Siemens 18-h.p., 400-V, 720-r.p.m. motor, with push-button operated contactor starter. The material is then run along a roller conveyor to a two-high reversible strip mill where it goes through its first rough rolling operation. It is usually subjected to two or three passes at this stage. The main motor is a Siemens 300-h.p., 400-V, 583-r.p.m. machine, and it has a reversing-type contactor starter, mounted on a platform between shop stanchions, "plugging" being employed for bringing the machine quickly to rest. The screwdown mechanism is driven by a 40-h.p., 400-V, 725-r.p.m. motor. Transmission from the main motor to the mill is through a double-helical reduction gear, giving a final rolling speed of 79 ft (24 m) per minute. The material may be coiled after rolling on one of the two coiling drums, situated one at each side of the mill. Each of these drums is driven through a friction clutch, so that as the material is being coiled from the roll a progressive reduction in the speed of the coiling drum can compensate for the increasing diameter of the coil. This mill is capable of effecting reductions to a maximum of 25 per cent and producing material up to 24 in. (61 cm) wide.

Finishing Process

Normally roughing and second roughing operations are carried out on the above mill, although a small amount of finishing is also done on this machine. For high-class finishes a two-high non-reversible mill is used, and this is fitted with a coiling drum at each side of the mill. On thin-gauge material coils are first wound on to one drum at the ingoing side of the mill, and then run through the mill and re-wound on the drum on the outgoing side. This gives tension to the coil at both sides of the roll. The mill is operated by a 80-h.p., 400-V, 730-r.p.m.

Met-Vick. motor controlled by push-button operated contactor equipment. Transmission is through reduction gearing to give a rolling speed of 70 ft (21 m) per minute. The coil drums on this mill have independent drives through friction clutches, the driving motor being a Met.-Vick 3-h.p., 1,440-r.p.m. unit which is served by push-button contactor gear. The mill rolls material up to 2 ft (61 cm) wide, and the reductions, which are somewhat lower than those on the first mill, are in the region of 15 per cent maximum.

A third mill, which is a cluster machine, is used for finish rolling up to 16-in. (41-cm) wide strip and it has two small-diameter work rolls backed up by four large rolls. The mill is driven by a Siemens 88-h.p., 975-r.p.m. motor, and this is served by a hand-operated starter. The mill is fitted with one coiling drum on the outgoing side. The reduction in speed to 75 ft (23 m) per minute is obtained through a double-helical reduction gear, and the coiling drum is friction driven from the main drive. The chief value of this type of mill is that, because of the small-diameter work rolls, and therefore a greater penetration for a given load, greater reductions can be given; the reductions are, in fact, in the region of 30 per cent.

Flattening the Strip

Levelling machines are used for flattening the strip. A typical example has nine small-diameter rolls, top and bottom, which are supported along their length by suitable backing-up rollers. From this machine the strip is run out on to a flat twill-covered table for inspection before re-coiling the strip and interleaving it with paper. The levelling machine is driven by a 15-h.p., 1,455-r.p.m. motor which is controlled by push-button operated contactor equipment.

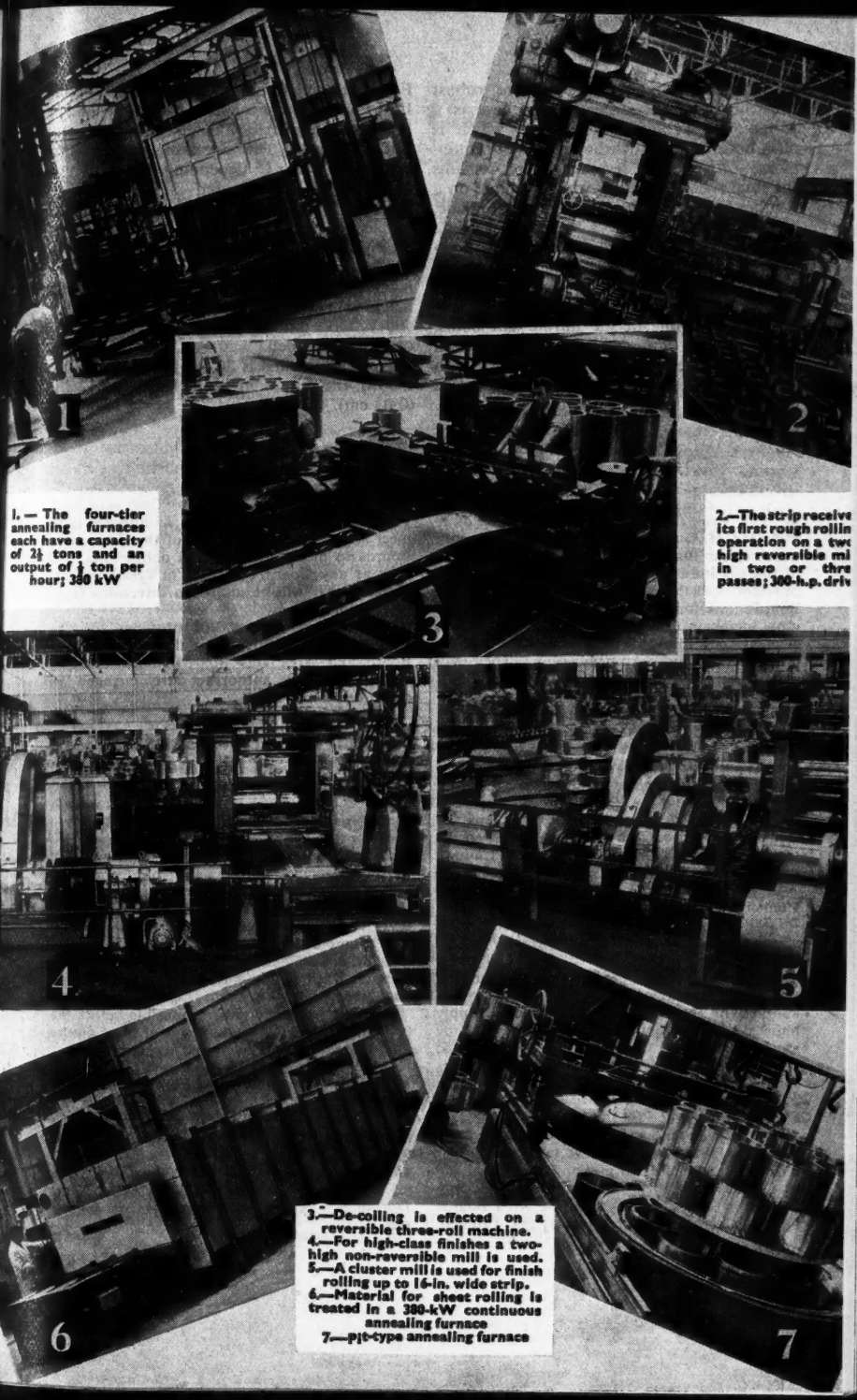
The final operation of slitting coils to size, either into multiples or single widths, is performed on a slitting machine fitted with circular cutters on two parallel shafts. The cutters can be set to any desired width by means of spacing pieces. The finished coils are re-wound on a coiling drum and the scrap edges from the sides are fed into a chopping machine which delivers the scrap in 6 in. (15 cm) lengths into a bin. The maximum width of coil manufactured is 24 in. (61 cm) and the minimum is $\frac{3}{8}$ in. (0·95 cm). The material varies from 0·012 in. (0·03 cm) thick up to $\frac{7}{16}$ in. (0·476 cm) thick, and the maximum weight of coil produced is in the region of 140 lb (63·5 kg).

For the cold rolling of sheet, blanks are received from the breaking-down mill described in the "hot-rolling" article, in various sizes dependent upon the size of the finished product, mainly $\frac{7}{16}$ in. thick. As in the case of coils, material is usually annealed at the blanking stage and at various points during the rolling processes. Two types of furnaces are installed for this purpose. The first is a Gibbons Wild-Barfield continuous annealing furnace rated at 380 kW and having an output of 2 tons per hour. The sheets are loaded on to an electrically driven conveyor consisting of three chains, and are run through the furnace. Air is circulated throughout the furnace by centrifugal fans. The second type of furnace, of which there are two arranged side by side, is the four-tier type. The mechanism used for charging is hand operated. These furnaces are of $2\frac{1}{2}$ tons capacity and have an output of $\frac{1}{2}$ ton per hour each. They are of Siemens manufacture and are rated at 380 kW. Air circulation in the furnaces is again obtained by the use of centrifugal fans.

Sheet Rolling

Three trains of rolls are used for cold rolling sheet. The first train consists of three two-high roll stands with rolls 200 mm long and 800 mm in diameter. This train is fitted with electrical screwdown mechanisms. The second train (see title illustration) consists of seven two-high roll stands with rolls 1,500 mm long and 700 mm diameter. This train is also fitted with electrically operated screw-down mechanisms, as is the third train which consists of three two-high roll stands with rolls 2,130 mm long and 700 mm diameter. Each train has an independent drive and the roll speeds are 180 ft (55 m) or 240 ft (73 m) per minute. The motors are 590-h.p., 350-h.p. and 400-h.p., 400-V, 730-r.p.m. The reduction speed is obtained through double-helical reduction gears and the drives from the gear boxes to the rolls are through shear pins inserted as a safety measure in cases of overload.

The motors are started by push-button units on control panels on which there are also mounted kW recording and indicating instruments, and signal lamps for oil pressures, etc. The starting equipments are situated on platforms mounted between the shop columns. The contact gears for the auxiliaries for each mill stand are also situated on these platforms. All controls are effected by push buttons. Where it is called for by the process, sheets are levelled on the roller levelling machine which is similar to the one used for



1.— The four-tier annealing furnaces each have a capacity of 2½ tons and an output of ½ ton per hour; 380 kW

2.—The strip receive its first rough rollin operation on a tw high reversible mi in two or thre passes; 300-h.p. driv

3.—De-coiling is effected on a reversible three-roll machine.
4.—For high-class finishes a two-high non-reversible mill is used.
5.—A cluster mill is used for finish rolling up to 16-in. wide strip.
6.—Material for sheet rolling is treated in a 380-kW continuous annealing furnace
7.—Pit-type annealing furnace

strip rolling, although of a more robust construction. The drive in this case is a 35-h.p., 400-V, 965-r.p.m. motor, which is push-button operated through contactor equipment. After final levelling there remains the final shear operation which is done on a Rhodes guillotine shear with a 13 ft blade. The shear is driven by a Metrovick 15-h.p., 950-r.p.m. motor which is controlled by a manually operated star-delta starter.

Where heat treatment is necessary, sheets and strips are fitted with spacers ready for immersion in one of the nitrate salt baths, for tempering and acquiring other desired physical properties. The sheet or strip in suitable cradles is lowered into and raised from the salt bath by an overhead crane. Each bath will accommodate about 30 sheets. It has an electrical loading of 450 kW, and is heated by immersion heaters under thermostatic control. The operating temperature is about 500 deg C, depending on the nature of the alloys being treated.

Following upon this treatment the material is passed through washing sprays and a drying chamber, and later, if required, it is treated in an electro-hydraulic stretching machine. The rotary type oil pump on this machine is driven by an E.C.C. 25-h.p., 400-V, 710-r.p.m. motor served by a manually operated star-delta starter. The maximum size of sheet rolled is 20 ft by 6 ft (6·1 m by 1·8 m), the minimum gauge being 0·012 in. (0·03 cm).

The Gas Bill

Proposed Nationalization of the Industry

LAST week the Minister of Fuel and Power (Mr. H. Gaitskell) introduced the Gas Bill, which is the instrument for the nationalization of the gas industry of Great Britain. The Bill provides for the setting up of twelve Area Boards (one for Scotland), with from seven to nine members, to develop and maintain an efficient, co-ordinated and economical system of gas supply and coke production. They may manufacture and sell carbonization by-products. There will also be a Gas Council, composed of the Area Board chairmen, with an independent chairman and deputy chairman, to advise the Minister and assist the Area Boards. It may also, if authorized by Area Boards, act on their behalf in matters of common interest. Both Council and Board will have power to manufacture gas plant and appliances, except for export, and a research programme is to be settled. Area Boards will arrange training schemes.

In each area there will be a Consultative Council, comprising the chairman of the Area Board and from twenty to thirty members appointed by the Minister to represent various interests.

The method of acquisition of the undertakings by the Area Boards follows closely that adopted in the case of the electricity supply industry. An exception is that in assessing the amount of British Gas Stock to be allotted to company shareholders adverse effects upon gas sales of wartime conditions are to be taken into account. In addition to stock allotted as compensation the Gas Council may create stock to raise money for the Council's and Boards' capital purposes or as temporary loans to a maximum of £250 million.

A central guarantee fund is to be established, formed by contributions from the Area Boards and (in certain circumstances) the Council. The fund with a maximum of £5 millions is to meet any temporary inability of the Council or Boards to meet their financial obligations. So long as any Board continues in default of its obligations it will be subject to directions from the Council.

One section of the Bill provides for the co-ordination of activities of the National Coal Board and Area Gas Boards in any areas in which the two authorities are engaged in carbonization.

French Electrical Construction

SINCE the nationalization of electricity in France, the programme of work undertaken has been considerable, and is designed to result in decreased costs and a complete exploitation of water-power possibilities and interconnection. The electrical industry has adapted itself well to the exigencies of the new equipment plan, and most of the main enterprises involved in the work have co-operated with others to carry out the work on the most modern lines. For example: the Assouan Barrage, in Egypt, is being undertaken by the Société de Construction des Batignolles with the participation of Etablissements Schneider.

The latter concern was responsible before the war for the complete equipment of the Coindre and Marèges plants, designed to supply energy for the electrification of railways. Since the war, it has participated in the equipment of the Genissiat plant on the Rhone, supplying two main 90,000-h.p., 150-r.p.m. turbines and two auxiliary 2,500-h.p. sets. It has a further 90,000-h.p. turbine in hand. It also supplied and installed the two main 70,000-h.p. 187-r.p.m. turbines for the Aigle plant on the Dordogne, as well as a number of smaller sets.

Views on the News

Reflections on Current Topics

WHEN I first heard eighteen months ago that the cost of the electric refrigerators for the temporary houses would be about £16, I thought this figure a little optimistic. This belief has been strengthened recently by the fact that identical units in cabinets have been selling to the general public (in infinitesimal numbers) for £45. Now I see in a Government White Paper that the "prefab" units are expected to cost £41 10s., but there still seems to be nothing definite about it.

* * *

It is surprising to find *The Times* on the side of regimentation. Yet in its comments last Saturday on the new Gas Bill I find it suggesting that "What are really wanted are tariffs which promote the use of all the various sources of fuel and power for the most appropriate purposes." In other words, the Government should decide whether gas or electricity should be used for a certain purpose and force consumers (regardless of their preferences and habits) away from the "undesirable" medium by prohibitive prices. This pernicious proposal repeatedly rears it ugly head, usually prompted by the apprehensive gas industry. Among other things, of course, such tariffs as *The Times* calls for would involve distinct prices for each application of gas and electricity—quite a long list. Electricity for cooking might be ¾d a kWh; for space heating the charge might be, say, 1s. But who knows whether the planners would not want to charge 1s. per kWh for cooking as well, to encourage people to use gas to keep alive a declining industry?

* * *

I see that Mr. F. Foulkes, the president of the Electrical Trades Union, has criticized some of the appointments in the new electricity supply "set-up." He appears to be satisfied with the composition of the British Electricity Authority but complains that the Area Boards include people outside the industry or in retirement. I think he is being rather unfair and that on the whole the Minister of Fuel and Power has done well. The Act lays down that Area Boards shall be representative of other than purely electricity supply interests and I do not consider that these outside interests are over-represented. As to the appointment of retired individuals: these people have the necessary experience to facilitate the launching of the scheme; they will probably not remain members of boards for very long and their departure will give scope for the movements essential in a live organization. A static arrangement would be very discouraging to the younger men.

* * *

International contacts between engineers are most likely to be fruitful when made through bodies which cover the same technical interests. The view to that effect expressed by the I.E.E. President, Mr. Percy Good, received pleasing support in the presentation last week to Mr. C. W. Marshall of the first Ampère Medal (*Electrical Review*, 23rd January), which was cast from coins in currency during the lifetime of the great scientist. The medal is to be awarded by the Société Française des Electriciens not more often than once a year to British electrical engineers. The warm tributes paid to them by M. Pilon, a past-president of the Société, who crossed the Channel for this occasion, can be cordially reciprocated. The readiness with which the earlier experience in France of transmission at over 100 kV was placed at the disposal of the C.E.B. during the construction of the grid was fittingly acknowledged by Mr. Marshall, whose linguistic proficiency had thus found unexpected scope.

* * *

It is a step in the right direction that London Transport is being enterprising enough to fit between 2,000 and 3,000 of its buses and coaches with radio interference suppressors. This is largely to prevent interfering with television reception, but short-wave sound programmes will benefit too. At the moment there are only about 31,000 television sets in use in this country, but obviously a tremendous expansion is to be expected within the next few years. Now is undoubtedly the time to start getting rid of an annoyance which, though easily and cheaply overcome, can ruin reception. Suppression devices, which need cost only about 1s. 6d., must eventually be incorporated in all apparatus capable of causing interference.—**REFLECTOR.**

NEW BOOKS

Reference Books for Electricians. Stage Lighting Practice.

The Maintenance Electrician's Handbook. By D. J. Hartshorne. Pp. 136; figs. 85; index. Sir Isaac Pitman & Sons, Ltd., 39, Parker Street, Kingsway, London, W.C.2. Price 8s. 6d. net.

There is a dearth of books written expressly for the works electrician, usually an isolated unit in the average industrial plant and often in need of a handy reference book. This small publication might have gone far to satisfy that need, but for the inclusion of several misleading and incomplete statements which seriously detract from the book's value in this respect.

For instance, on page 113 the author describes the alkaline battery, but goes on to say that the voltage should not be allowed to fall below 1·8 V per cell, without indicating in the context that he is now referring to the lead-acid cell. The alkaline cell voltage is not mentioned, nor are instructions given as to electrolyte make-up, except in general terms.

On page 122 the author discusses the moving-coil voltmeter, stating that this type can be used on a.c. circuits by incorporating a rectifier. There is no mention of the fact that scale indication is thereby changed from virtual to average values and that a correction factor must be applied, or that a rectifier instrument may read inaccurately on d.c., or even on a.c. of a distorted wave form.

Regarding the more important omissions, in any consideration of battery-charging arrangements the popular constant-voltage method should certainly have been included. The matter of earthing is of outstanding importance to the works electrician, but it is not mentioned in the index, while continuity is disposed of in about thirty lines, and earth-leakage protection for portable tools should have been explained. Space for these additions could very easily be made by the omission of reprints of tables from the I.E.E. Regulations, which are usually readily available in the works electrician's own copy.

In spite of these shortcomings, however, the book contains several very useful chapters, notably those dealing with induction motors and starters, their commoner faults, and industrial lighting; power-factor correction also receives attention. For its good points the book can be recommended.—T.C.G.

Electrical Installation Rules and Tables. By W. S. Ibbetson, B.Sc., A.M.I.E.E., M.I.Mar.E. Pp. 192. E. & F. Spon, Ltd., 57, Haymarket, London, S.W.1. Price 7s. 6d.

The first post-war edition of this pocket-book (which is not too big to justify the name) is actually the fourth of a series which started in 1921. Intended for "practical wiremen, electricians, engineers, contractors and architects," its justifiable claim to make rapid reference possible is supported by an adequate alphabetical index.

The general arrangement of the contents follows that of the 1944 edition, but additional information is included on fluorescent lighting and high-rupturing fuses. In addition to the chief contents of the Eleventh Edition of the I.E.E. Wiring Regulations (including the 1946 Supplement), which occupy 81 pages, and elementary conversion and other tables, there are notes on illumination, motors and their faults and remedies, power factor, voltage-drop calculations, power required for machinery drives, heating and accumulators. While the data given are necessarily brief in view of the designedly compact form of the book, those presented have been well chosen for their purpose.—C.O.B.

The Technique of Stage Lighting. By R. Gillespie Williams. Pp. 194; figs. 71, and 6 colour plates. Sir Isaac Pitman & Sons, Ltd. Price 21s.

There can be no doubt that this is a most valuable book for anyone who has anything to do with stage lighting, whether, as producer, he is concerned with its use; or whether, as electrical engineer or contractor, he is responsible for its design or installation. Although Jack Hulbert, in his preface, says that "stage lighting is still in its infancy," great developments have taken place in this specialized field of illuminating engineering during the last two or three decades. Nevertheless there is undoubtedly a very widespread lack of appreciation of what can now be achieved with modern equipment. It is to be hoped that this book will improve the position.

Only those who have had an opportunity of seeing the multiplicity of apparatus used for a major production at one of the larger theatres can have any conception of the complexity of the subject. Although the author does not attempt to deal with the projection of scenery, and only mentions briefly the production of special effects, he describes very fully all the many types of lighting equipment proper and the often very complicated controls, dimmers and the like, which play such an important part in modern stage lighting.

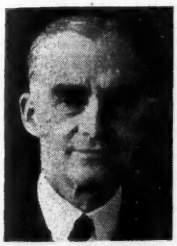
Not only the technician and the producer, but every playgoer who is interested in knowing "how it is done," will enjoy reading this book and though the amateur producer, whose whole equipment consists of footlights, a couple of battens and a few "spots," will find it as tantalizing as the Chelsea Flower Show is to the suburban gardener, nevertheless when at last he puts the book down, he will do so with a firm resolve to make more of his limited resources than he has ever done before.—J.W.T.W.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE British Electricity Authority has appointed **Dr. D. P. Pringle**, formerly medical officer to Standard Telephones & Cables, Ltd., as the Authority's chief medical officer.

Mr. J. W. Leach, M.I.E.E., who, as reported in our last issue, has been appointed chief engineer of the London Electricity Board, received his training as a pupil with the British Thomson-Houston Co., Ltd., at its Rugby works. He was engaged in various positions with the company. Later he joined the Westminster Electric Supply Corporation, Ltd., and upon its amalgamation with other London companies became deputy and then engineer-in-chief of Central London Electricity, Ltd.



Electricity Board chief engineers (left to right): Mr. J. W. Leach (London), Mr. O. Howarth (North Western) and Mr. T. M. Ayres (North Eastern)

Mr. Oliver Howarth, M.I.E.E., sales manager and chief technical engineer of the Lancashire Electric Power Co., since 1945, has been appointed chief engineer to the North Western Electricity Board. **Mr. W. Appleyard**, has been appointed chief accountant.

Mr. T. M. Ayres, M.I.E.E., has been appointed chief engineer of the North Eastern Electricity Board. He has been with the North Eastern Electric Supply Co. and its predecessors since 1914, and is now the company's chief electrical engineer. **Mr. E. J. Corbett**, C.A. (Glasgow), has been appointed chief accountant to the Board. He is at present chief accountant to the North Eastern Electric Supply Co. **Mr. J. E. Hayes**, A.C.A., becomes secretary to the Board. He is secretary to the North Eastern Co.

Mr. J. W. Bird, M.B.E., D.L., A.M.I.E.E., assistant manager of the South Wales Power Co., is to be chief engineer to the South Wales Electricity Board. The secretary is **Mr. D. G. Dodds**, deputy town clerk of Cardiff; the chief commercial officer **Mr. J. F. Smith**, B.Sc., A.M.I.E.E., consumers' engineer, South Wales Power Co.; and the chief accountant **Mr. S. R. Butler**, A.C.A., who holds a similar post with the South Wales Power Co. We regret that in the caption to last week's picture of the South Wales Board the name of the chairman, **Mr. L. Howles** was mis-spelt.

The Midland Electricity Board has appointed **Mr. D. P. Sayers**, B.Sc., M.I.E.E., M.I.Mech.E., as chief engineer; **Mr. H. J. Gibson**, B.Sc., M.I.E.E., chief commercial officer; **Mr. F. Nock**, A.S.A.A., A.C.I.S., chief accountant; and **Mr. A. Stephens**, A.C.I.S., secretary.

Mr. T. R. Warren, M.A., B.Sc., M.I.E.E., has been appointed chief engineer to the South East Scotland Board and **Mr. T. J. Mullan**, M.A., LL.B., secretary.

Although the central office of the International Electrotechnical Commission is now being transferred from London to Geneva, upon affiliation to the International Organization for Standardization, **Mr. C. le Maistre**, C.B.E., is retaining the position of general secretary. **Mr. L. Ruppert**, who has been with Mr. le Maistre for over twenty years, has been appointed administrative secretary and will carry on the day-to-day work. Mr. le Maistre is shortly spending some weeks in Geneva to assist at the sessions of the advisory committees.

The English Electric Co., Ltd., announces the retirement of **Mr. J. A. Osborn** from the Steam Turbine Department, in which he has occupied the position of technical adviser to the branches for the past eleven years Mr. Osborn spent his early years with Fraser & Chalmers, whom he joined in 1905, and he worked on that company's first impulse turbine. In 1916 he was appointed chief engineer on steam turbines and blowers with Daniel Adamsons, and in 1919 he joined the English Electric Co. Mr. Osborn has been presented with a cheque subscribed by his friends and colleagues.

Mr. J. A. Osborn

Mr. Clifford March, M.I.E.E., deputy chief electrical engineer of the Hornsey Electricity Department since 1939, has been appointed acting chief electrical engineer and manager in succession to Mr. F. C. Orchard, who recently took up his duties as "chief" at Watford.

Mr. March went to Hornsey in 1919 as assistant mains engineer after holding positions in the Colchester and Stoke-on-Trent undertakings.

Mr. T. S. Read recently retired from the Edison Swan Electric Co., after forty-five years' service. Mr. Read joined the company in 1902 as production engineer and was appointed London sales manager in 1915 and joint sales manager in 1921. He was responsible for the organization of Ediswan branches and offices throughout the United Kingdom. He represented the company as alternate member on the Electric Lamp Manufacturers' Association, and on several **B.E.A.M.A. committees.** When the company was taken over by Associated Electrical Industries, Mr. Read again became London manager and negotiated the fusion of the London sections of the B.T.H. and Metvick Companies and other organizations transferred. He was also closely connected with the initiation and development of Edison Swan Cables, Ltd. During recent years Mr. Read has been engaged on sales development work and special duties for the executive.

Mr. T. S. Read

We are glad to hear that **Mr. G. N. Green,** Peterborough borough electrical engineer and manager, is progressing satisfactorily after his recent operation.

Mr. H. C. E. Miller, F.C.A., has been appointed a director of the Rheostatic Co., Ltd.

Mr. S. B. Warder, M.I.Mech.E., M.I.E.E., who has been appointed electrical engineer to the Railway Executive, Southern Region, was educated at Glasgow High School, and obtained his technical education at the University of London. After serving an apprenticeship with Johnson & Phillips he gained further experience with Ferguson, Pailin, Ltd., Manchester, and later as an engineer with the G.E.C., Witton. In 1927 he joined the Swedish General Electric Co. (later Asea Electric, Ltd.), as an engineer in the Export Department, and eventually succeeded to the position of chief engineer and manager of that department. He joined the Southern Railway in 1936 as technical assistant to Mr. A. Raworth, then electrical engineer for new works, and was appointed new works assistant to the chief electrical engineer in 1943. He recently visited North America to study and report on the development of diesel electric traction in the United States and the possibility of its application in this country. He was appointed assistant to the chief electrical engineer in 1947.

Mr. S. B. Warder

A wrist watch was presented by Chorley employees of the Lancashire Electric Power Co., to **Mr. J. W. Jones,** who, after sixteen years as district engineer and manager, has been appointed assistant mains superintendent.

Sir Charles Darwin, Director of the National Physical Laboratory, has accepted an invitation to become a member of the Board of the Colonial Development Corporation.

Mr. J. A. Smale, A.F.C., B.Sc., M.I.E.E., has been appointed engineer-in-chief of Cable & Wireless, Ltd., as from 1st February. He will succeed **Mr. G. H. Entwisle,** who is retiring after a year's extension of service. Mr. Smale will leave London shortly on a tour of the company's wireless relay stations at Barbados in the West Indies, Nairobi and Colombo, which are being extended. Mr. Smale was educated at Wycliffe College, Stonehouse, Glos., and Bristol University and served an engineering apprenticeship with the B.T.H. Co. In 1914 he joined the R.N.A.S.

Mr. J. A. Smale

He later became responsible for developing a system of emergency wireless circuits to cover temporary interruptions of the cable system and developing wireless relay stations. In 1924 he designed and tested equipment for frequency shift signalling and he was associated with the earliest development work on the transmission of pictures by wireless and has since initiated many improvements in this and other directions.

Mr. H. G. Weaver, M.I.E.E., has relinquished his position as chief electrical engineer to Richard Thomas & Baldwins, Ltd., and now resides at Shrewsbury. His telephone number is 2253.

Mr. Bert Cole, director of Falk, Stadelmann & Co., Ltd., and of Stoves, Ltd., completes fifty years' service with the parent company this month.

Mr. G. W. Molle, B.Sc., M.I.E.E., informs us that his address is now Stanhope Court Hotel, Stanhope Gardens, S.W.7 (Frobisher 1101).

Mr. E. Arthur, mains and substation constructional engineer with Wallasey Corporation Electricity Department, has been appointed technical assistant with the Pontypridd U.D.C. Electricity Department.

Mr. P. J. Crose has been appointed sales manager of Agro Electrical Co., Ltd., from 1st February.

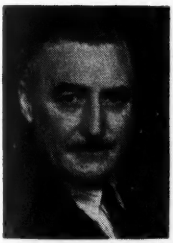
Mr. R. Lenoir, who is now in his twenty-first year with Smiths English Clocks, Ltd., has been elected to the board of the company.

Smiths English Clocks, Ltd., announces the following appointments:—**Mr. W. A. Lotter** to be assistant home sales manager; **Mr. K. Pearce,** sales office manager (clock department); **Mr. D. Sydenham,** sales office manager (watch department); and **Mr. H. Baker,** advertising and sales promotion manager.

Mr. H. Jasper Gripper, B.Sc., A.M.I.E.E., A.M. (S.A.) I.E.E., recently resigned from the position of municipal electrical engineer at Worcester (South Africa) to become assistant city electrical engineer at Port Elizabeth. Mr. Gripper served his apprenticeship with the Metropolitan-Vickers Co., Manchester, and was later employed in the company's Traction Department. After returning to South Africa, Mr. Gripper held several engineering and commercial appointments in Johannesburg and Cape Town, including the positions of electrical and resident engineer with the Union Steel Corporation in Vereeniging from 1932 to 1936.

Mr. I. A. Marriott, who joined the new board of W. G. Bagnall, Ltd., locomotive builders and designers, of Stafford, when it was acquired by Heenan & Froude, Ltd., towards the end of last year, has been appointed managing director. He is also acting as the representative of the Brush Electrical Engineering Co., Ltd., on the Internal Combustion Group of the Locomotive Manufacturers' Association.

Mr. F. Neil Sutherland, M.A., M.I.E.E., who has been appointed general manager of Marconi's Wireless Telegraph Co., Ltd., joined the English Electric Co. in 1922 after taking his degree at Cambridge. He served an apprenticeship in the Dick Kerr works, Preston, and was later at other works of the English Electric Co. In 1925 he was appointed the English Electric Co.'s chief engineer in South America and in 1930 general manager for Brazil. In 1936 he became managing director of the English Electric Co., Ltd., in South Africa. During the war he visited England frequently in connection with supplies to South Africa of electrical plant for the manufacture of munitions. While in South Africa, Mr. Sutherland was responsible for the building of the English Electric Benoni works near Johannesburg. He left South Africa in December last.



Mr. F. N. Sutherland

Mr. R. Murray is to be appointed to the board of Lewis Berger (Scotland), Ltd., and will serve as managing director as from 1st March next. Mr. R. Murray is a senior executive of Lewis Berger & Sons, Ltd., the parent company, and his association with that company extends to nearly twenty-five years.

The annual meeting of the Lancashire, Cheshire Radio and Electrical Golfing Society was held on 21st January, when **Mr. J. D. Morrison** was re-elected president and **Mr. H. Richardson** was elected captain.

Mr. C. F. Saunders, Assoc. M.C.T., A.M.I.E.E., has been appointed chief engineer of the Welding Department of the Metropolitan - Vickers Electrical Co., Ltd., in succession to **Mr. H. West,** who has relinquished this appointment in order to devote full time to his duties as assistant to the chief electrical engineer. Mr. Saunders joined the company as a school apprentice in 1916, and after war service in the R.E. (Signals) he joined the Motor Engineering Department in 1922. After a period in the Motor Sales Department, he returned to the Motor Engineering Department as chief cost engineer, which position he has held until now.

Mr. C. F. Saunders

The Elizabeth Sloan Chesser Cup, presented by the Electrical Association for Women, will be held in 1948 by **Miss W. K. Wilson** of Edmundsons Electricity Corporation, Ltd., who obtained the highest marks in the general test for the E.A.W. diploma for demonstrators, gaining a first-class pass in laundry, cookery and salesmanship. The runner-up was **Miss E. D. Duffield** of Stockton-on-Tees Electricity Department.

Mr. R. J. Allaway, general manager of Wholesale Electrical Components, Ltd., has been appointed sales director of the company and **Messrs. W. Church** and **S. Baker** have been appointed sales representatives.

Mr. B. V. Hawgood, of Rhodelect, Ltd., of Salisbury, Southern Rhodesia, is visiting this country primarily with the object of discussing Rhodesian conditions with British electrical manufacturers and with the object of increasing his company's handling of British products in Rhodesia. Communications can be sent through the Royal Bank of Canada, 6, Lothbury, London, E.C., between 9th February and 15th March.

More than 1,000 guests coming from as far afield as South Wales, London, Aberdeen, Glasgow and York attended the Electrical Development Association carnival in the Oxford Galleries, Newcastle-on-Tyne on 23rd January. They were received by Lt. Col. E. H. Woodward, managing director of the North Eastern Electric Supply Co., and member of the British Electricity Authority, and Mrs. Woodward.

At the final shoot which was held on 17th January at the L.P.T.B. Central Rifle Range, Baker Street, the Gravesend Electricity Department's team won the championship of the Electricity Supply Rifle League. This team is also the top of the First Division and for the championship it competed against Shoreditch Electricity Department, which is at the top of the Second Division.

The apprentices at the Willesden works of Lancashire Dynamo & Crypto, Ltd., held their annual dinner on 9th January at the Park Royal Hotel, W.5; foremen and senior executives also attended. They were welcomed by Mr. D. C. Lorkin (director) who briefly reviewed the improvement which had been made during recent years in the apprenticeship schemes. Proposing the toast of the apprentices, Mr. D. Watt, sales manager, reminded them that it was the policy of the company to select its sales and technical staff from its own trained personnel. Mr. D. G. Hewitt, senior apprentice, responded. The " F.H.S." silver cup for the best all-round apprentice for 1947 was presented to Mr. P. Read. The toast of the company was proposed by Mr. C. F. Jackson (accountant) and Mr. W. G. Swain replied on behalf of the board. A short entertainment concluded the evening.

The directors of Gresham Transformers, Ltd., recently entertained employees and guests at Haworth to their annual New Year party. In addition to dancing, there was a variety show by well-known artists and members of the staff. Short speeches were made by the chairman and other directors.

The Ekco Players, the dramatic section of the Ekco Social and Sports Club, presented a pantomime, " Aladdin and His Ekco Lamp," in the Ekco Canteen during the week from 19th to 24th January. The pantomime was written and produced by Mr. Clark Ramsay, the company's press relations officer. Several Southend organizations benefit from the proceeds, including Southend General Hospital and the R.A.F. Association. The title role was very well played by Miss Norma Bourne, while Mr. Bill Fraser gave a talented performance as the " Emperor."

On 20th and 21st January a party was given by the Sheffield Electricity Committee to employees and friends of the Department in celebration of the jubilee of the undertaking. Each evening there were approximately a thousand guests at the City Hall. The evenings were spent in dancing and whist, and a short sketch by employees of the Department was produced. This was followed by an address from the chairman of the Electricity Committee, **Councillor J. W. Holland,** and on the second evening the general manager, **Mr. J. R. Struthers,** presented Councillor Holland with a memento from the employees in the form of a silver pencil bearing his name and the date.

The twenty-first annual sports of the Indian Cable Co., Ltd., were held on 11th January on the factory recreation ground at Tatanagar, Bihar, India. The heats had been run off on the previous day and the programme consisted of the finals of twenty-one track and field events. As is usual for this time of the year, the afternoon provided sunshine that was not excessively hot for either the competitors or the very large number of spectators. The Cableco Championship cup was won for the fourth successive time by P. Ramalingam, (welder) who also again won the special silver cup presented by the British Electric Co., Ltd., of Calcutta. The clerical staff of the factory general office won the tug-of-war for the third successive year. After tea the prizes and trophies were presented to the winners by Mrs. E. D. Johnson.

In order to support the export drive four senior members of the sales staff of the Benjamin Electric, Ltd., have recently left on special visits to overseas territories. They are Mr. A. G. Smith, who is going to South and East Africa, Mr. C. H. Pellow who is visiting Australia, Mr. G. O. Bateman who is going to India and Pakistan, and Mr. E. A. Monypenny, who is going to New Zealand.

On 17th January nearly 400 children of employees of McKechnie Bros., Ltd., Birmingham, were taken by coach to see " Cinderella," and returned for tea and a party in the works canteen.

Obituary

Sir Allan Powell, G.B.E., who was chairman of the board of governors of the B.B.C. from 1939 to 1946 died on Saturday last in his sixty-ninth year.

Mr. W. Elsdon-Dew, M.I.E.E.—The *South African Mining and Engineering Journal* reports the death in Durban at the age of seventy-eight of Mr. W. Elsdon-Dew, who was for nearly twenty-five years the local hon. secretary and treasurer of the Institution of Electrical Engineers, and was a past-president of the South African Institute of Electrical Engineers. Mr. Elsdon-Dew was educated at the Antigua High School, British West Indies, and Finsbury Technical College, London. In 1895 he was appointed engineer to the Transvaal Gold Exploration & Land Co. This company was later merged in the Transvaal Gold Mining Estates as part of The Corner House group, of which Mr. Elsdon-Dew became consulting electrical and mechanical engineer. A hydro-electric scheme which he undertook in the Pilgrims Rest district was then the largest electrical enterprise in South Africa.

Wills.—Air Comdre. H. Leedham, C.B., O.B.E., managing director of Ericsson Telephones, Ltd., left £6,623 (net personalty £6,472).

Mr. A. Southworth, chief engineer of the G.E.C. engineering works, Witton, left £2,470 (net personalty £2,408).

Divisional Controllers

Future Responsibility for Generation and Transmission

LAST week we announced the appointment by the British Electricity Authority of the controllers of the divisions which will form the new "layout" for generation and main transmission purposes. There are fourteen of these divisions coinciding in name and extent with the fourteen Electricity Areas, but distinct from them in that they will come under the Central Authority to whom the divisional controllers will be responsible.

Mr. J. N. Waite (London)

Mr. W. C. Parker (South Eastern)

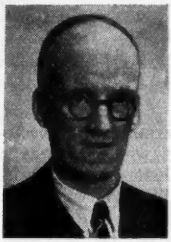
We now reproduce portraits of the controllers and give a very brief note on their careers.

Mr. J. N. Waite (*London Division*) has been manager of the South-East and East England Districts of the Central Electricity Board since 1938. He was previously chief engineer and general manager of the Hull Corporation Electricity Department.

Mr. W. C. Parker (*South Eastern Division*), after gaining experience with Crompton Parkinson, Ltd., and the English Electric Co., Ltd., went to the Fulham Corporation undertaking, of which he has been engineer for the past thirteen years.

Mr. R. H. Coates (*Southern Division*), is engineer and manager of the Portsmouth Electricity Service, a position which he has held since 1945. He was formerly deputy general manager and engineer of the Sheffield Corporation Electricity Department.

Mr. R. H. Coates (Southern)



Mr. W. N. C. Clinch (Eastern)

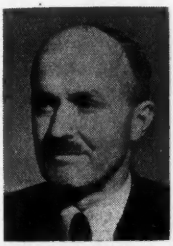
Mr. J. T. H. Legge (*South Western Division*), has been manager of the South West England and South Wales Area of the Central Electricity Board since 1935, having previously been managing director of Edmundsons Electricity Corporation, Ltd.

Mr. W. N. C. Clinch (*Eastern Division*), was for some years engineer and manager of the Brighton Corporation electricity undertaking, until he became general manager of the Northmet Power Co.

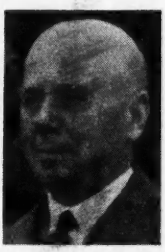
Mr. W. S. Burge (*East Midlands Division*), was for many years with the English Electric Co., Ltd., and gained considerable experience in steam engineering practice in this country and the United States. He then joined the

Mr. W. S. Burge (East Midlands)

Mr. F. W. Lawton (Midlands)



Mr. H. V. Pugh (South Wales)

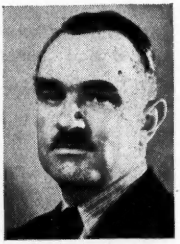


Mr. J. T. H. Legge (South Western)

Central Electricity Board and eventually became manager of the Central England District.

Mr. F. W. Lawton (*Midlands Division*), is the chief engineer and manager of the

Mr. C. T. S. Arnett
(North Western)



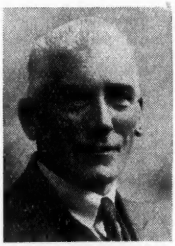
Mr. A. R. Cooper
(Merseyside and N. Wales)

Birmingham Electric Supply Department, of which he was previously deputy chief. He has been at Birmingham for about thirty-four years and before that was at Stoke-on-Trent.

Mr. H. V. Pugh (*South Wales Division*), was appointed deputy chief engineer of the Manchester Corporation Electricity Department in 1944. Before that he was generation engineer to the South Wales Power Co.

Mr. A. R. Cooper (*Merseyside and North Wales Division*), has been with the Central Electricity Board since 1935, having previously had considerable industrial experience. He is at present chief operation engineer to

Mr. J. C. Mitchell
(North Eastern)



Mr. G. A. Vowles
(Yorkshire)

the Board and was formerly operation engineer in the South East and East England Districts.

Mr. G. A. Vowles (*Yorkshire Division*), was chief engineer and manager of the Halifax Corporation undertaking until 1939, when he was appointed "chief" of the Ipswich Electricity and Transport Departments.

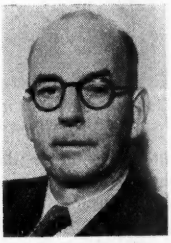
Mr. J. C. Mitchell (*North Eastern Division*) holds the position of chief mechanical engineer to the North Eastern Electric Supply Co., having previously served that company in a number of senior positions.

Mr. C. T. S. Arnett (*North Western Division*), has been manager of the North West England and North Wales Areas of the Central Electricity Board since 1939. Before that he was the Board's operation engineer in these areas. Mr. Arnett was made an O.B.E. in the New Year Honours.

Mr. J. F. Field (*South East Scotland Division*), joined the Edinburgh Corporation electricity undertaking in 1940 after service with the C.E.B. He is now engineer and manager, a position to which he was promoted in 1944 from deputy engineer and manager of the Department.

Mr. E. J. Edgar (*South West Scotland Division*), is manager of the Central and

Mr. J. F. Field
(S.E. Scotland)



Mr. E. J. Edgar
(S.W. Scotland)

South Scotland Areas of the Central Electricity Board. Before this he occupied a similar position in the North East England Area.

Coal Classification

A COMPREHENSIVE paper on coal assessment prepared by MR. R. A. MOTT, D.Sc., F.R.I.C., F.Inst.F., was read last week before the Yorkshire Section of the Institute of Fuel at Sheffield. A repeat reading is to be given before the Scottish Section at University College, Dundee, on 26th March. Dr. Mott commenced by reviewing early methods of assessment and classification of coal, continuing with the bases for assessment and classification such as the effect of geological age, different kinds of coal and relationship between the composition and properties thereof. The composition of coals in the different countries of the world was then discussed in some detail after which the various methods of coal classification were described. Dr. Mott concluded by explaining the use of these methods of classification in practice. The bibliography consisted of eighty-eight references.

Overseas Trade

Spectacular Advance in Electrical Exports

The value of electrical equipment exported last year—£74·3 million—was three and a half times as much as in 1938

DESPITE the Christmas holiday, exports of electrical goods and machinery reached the highest level ever attained in one month; the total of £7,389,127 was about £55,000 above the previous highest figure—recorded in July last—and it compared with a figure of £5,379,286 for December, 1946, and only £1,829,198 as the monthly average for 1938.

The increase as compared with December, 1946, was general; the only exceptions appear to have been submarine cables, radio valves, primary batteries, convertors, rectifiers and switchgear. Other cable classes were well up and so were exports of domestic radio receivers. There were very substantial shipments of a number of classes, notably telegraph and telephone equipment, lighting fittings, and motors.

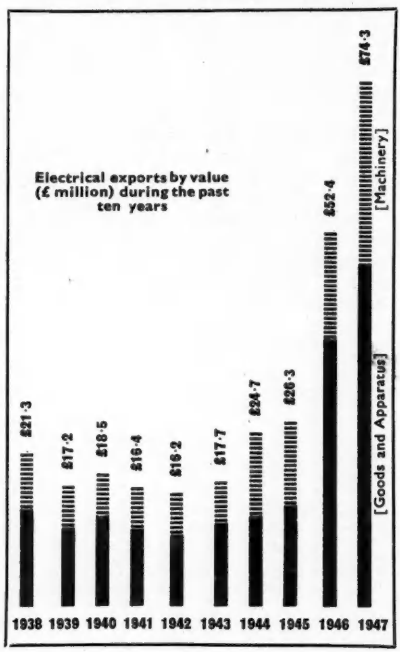
British India was the principal customer for electrical goods and machinery in December (goods and apparatus, £745,501; specified machinery, £572,237). South Africa ranked second.

Table I.—Electrical Exports and Imports

Class	Exports			Imports		
	1947	1946	1938	1947	1946	1938
	£	£	£	£	£	£
Telegraph and telephone wires and cables, submarine	484,766	789,070	207,473			
Ditto, not submarine	3,063,761	2,669,518	861,638			
Wires and cables, other than telegraph and telephone, rubber insulated	5,090,352	2,943,173	1,410,403	85,383	25,320	374,948
Ditto, insulation other than rubber	5,088,153	4,396,836	1,839,077			
Commercial radio apparatus	1,434,748	1,079,258	339,558	*	*	*
Domestic radio receivers	4,600,092	3,318,147	441,065	28,453	103,050	121,771
Telegraph, telephone and signalling apparatus	†6,713,288	4,961,537	2,912,595	74,629	36,079	110,919
Other radio, etc., apparatus	2,659,733	1,518,008	694,164	309,667	4,158,838	574,436
Valves	1,501,724	1,776,492	495,270	362,386	154,644	130,712
Electric carbons, furnace	*	*	*	456,437	64,091	48,649
Other electric carbons	*	*	*	49,361	70,478	27,612
Electric lamps	1,283,509	1,291,496	593,282	49,647	8,352	123,175
Other lighting apparatus	3,228,308	2,056,144	582,783	86,933	16,588	463,949
Primary batteries	498,891	551,454	162,862	21,139	9,853	42,592
Accumulators for motor vehicles	1,428,991	982,313	197,012	*	*	*
Ditto, portable	593,156	368,839	149,473	*	*	*
Ditto, stationary	288,569	176,178	237,272	*	*	*
Ditto, parts and accessories	570,596	560,157	*	*	*	*
Electric cooking and heating apparatus	2,676,573	1,271,075	367,964	*	*	*
Commercial electrical instruments, including ammeters, voltmeters, etc., and parts	1,031,615	653,060	190,536			
House service meters	1,119,749	533,496	189,496	204,474	83,590	384,688
Other electrical instruments	753,557	501,161	115,350			
Electro-medical apparatus other than X-ray	253,678	181,714	36,460	*	*	*
X-ray apparatus, vacuum tubes and parts	698,394	620,999	58,573	301,944	163,227	116,810
Insulating materials, not elsewhere specified	1,298,925	1,236,465	232,122	*	*	*
Unclassified electrical goods and apparatus	3,064,356	3,228,295	1,296,983	267,764	142,308	635,763
Generators, complete, up to 200 kW	1,672,242	778,879	456,853	*	*	*
Ditto, over 200 kW	3,844,542	2,374,672	1,428,953	*	*	*
Ditto, parts	2,172,449	778,873	*	*	*	*
Railway and tramway motors	639,253	339,207	191,720	*	*	*
Other motors up to ½ h.p.	454,438	261,459	108,015	47,149	30,390	149,408
Ditto, over ½ h.p., but under 1 h.p.	351,420	152,884	29,638			
Ditto, 1–250 h.p.	2,920,565	1,921,026	1,159,644	55,597	5,481	156,564
Ditto, over 250 h.p.	407,635	206,308	251,523	64,681	26,756	6,428
Converting machinery	173,519	159,464	1,215,654	*	*	*
Transformers, including coils	3,374,794	2,010,252				
Rectifiers for power house use	223,022	135,188	41,558	*	*	*
Motor starting and controlling gear	1,177,085	932,867	610,392	*	*	*
Switchgear and switchboards, other than telegraph or telephone	4,513,702	2,887,607	2,214,402	*	*	*
Other electrical machinery	265,739	218,850	185,960	751,793	43,263	173,459
Electric vacuum cleaners and parts	2,423,768	1,030,223	319,941	*	*	*
Other electrically-operated portable appliances	294,430	488,719	124,730	71,041	26,006	295,516
Total	74,333,867	52,411,363	21,950,394	3,217,437	5,142,308	3,641,883

* Not classified separately. † Figures for 1947 are not strictly comparable with those of previous years.

Imports of electrical equipment during December were substantially higher than in the corresponding month of 1946—£283,639



against £197,602. This was accounted for entirely by larger imports of motors and other machinery including, no doubt, small generating sets.

The December figures complete the overseas trade story for the year and this month's tables therefore cover the whole of 1947. They disclose an almost phenomenal increase in exports, from £52 million in 1946 to £74 million last year, and the total was about three and a half times that for 1938.

As will be seen from Table I, every class, with six exceptions, showed a substantial rise. The exceptions were submarine cables, radio valves, lamps (a very slight reduction), primary batteries, portable accumulators (other than vehicle types) which were somewhat heavily reduced, and electrically-operated portable appliances, other than vacuum cleaners, exports of which more than doubled in value.

Many classes registered very remarkable increases; perhaps the most noteworthy were those in the shipments of lighting equipment (other than lamps) and heating and cooking apparatus.

Probably, however, the outstanding feature of the table is the extent to which electrical machinery and allied exports rose. While in 1947 exports of electrical goods and apparatus increased by about 30 per cent as compared with 1946, machinery exports went up by nearly 70 per cent.

From Table II, showing the destinations of electrical goods and apparatus, it will be seen that British India (£6,737,762) headed the list with South Africa (£6,481,447) a close second; these two countries' shares in 1946 were about the same, but their positions have been reversed. The next largest customers, Australia (£2,553,984), New Zealand

Table II.—Distribution of Exports of Electrical Goods and Apparatus

Destination	1947	1946	1938
	£	£	£
Eire	2,052,563	1,207,921	452,715
Channel Islands ..	512,301	413,240	146,125
Palestine	1,183,719	930,015	101,116
British W. Africa	555,373	488,006	154,673
Union of S. Africa	6,481,447	4,710,192	1,951,005
Southern Rhodesia	570,108	330,176	115,586
British E. Africa	578,821	412,662	94,710
British India ..	6,737,762	4,615,537	1,485,467
Burma	566,577	248,015	64,043
British Malaya ..	1,695,916	959,900	393,508
Ceylon	447,951	276,013	180,575
Hong Kong ..	599,013	391,553	155,261
Australia	2,553,984	2,416,334	2,368,391
New Zealand ..	2,475,392	1,652,615	1,154,713
Canada	466,183	256,690	150,558
British West Indies	443,372	314,671	155,445
Other British Countries ..	1,052,480	764,667	255,184
Soviet Union ..	653,046	711,683	441,377
Finland	308,562	274,018	71,624
Sweden	1,559,883	821,818	179,379
Norway	1,668,670	1,021,491	154,564
Iceland	215,844	438,893	33,551
Denmark ..	828,274	868,318	226,890
Poland	335,743	198,844	116,426
Netherlands ..	1,127,668	998,096	264,117
Belgium	1,202,088	1,226,273	134,499
France	474,973	1,773,646	192,974
Switzerland ..	347,728	333,163	45,216
Portugal	792,391	981,601	78,145
Spain	421,373	677,364	45,755
Czechoslovakia ..	322,138	199,221	86,460
Yugoslavia ..	291,555	133,067	17,703
Greece	412,482	164,928	59,113
Turkey	662,840	582,308	92,200
Portuguese East Africa ..	148,175	64,701	83,304
Egypt	906,740	1,043,294	158,114
Iraq	847,084	392,254	66,362
Iran	956,951	706,290	196,141
China	833,914	474,934	49,401
United States of America ..	127,059	132,416	70,064
Mexico	147,313	196,307	17,592
Venezuela ..	414,845	313,094	35,239
Chile	187,868	99,029	79,621
Brazil	893,387	368,799	133,962
Argentine Republic	1,346,429	833,657	545,424
Other Foreign Countries ..	2,017,279	1,317,171	557,119
Total ..	49,425,264	37,734,885	13,611,411

(£2,475,392) and Eire (£2,052,563) were a long way behind the leaders, but in the case of the last two there were very substantial increases in purchases. The recovery of Malaya is reflected in the rise in imports of British electrical equipment.

Among foreign customers, importance may be attached to the greater shipments to Sweden, as a "hard-currency" country; it will be seen that Sweden's purchases rose by about 90 per cent to £1,559,883. Unfortunately the other European "hard-currency" countries—Switzerland and Portugal—did not do as well. The United States' share was smaller, but against this there was a rise in Canada's imports and trade with Argentina showed a noteworthy improvement. Russia's purchases declined, but that country's imports of British electrical machinery were well up—generators from £905,461 to £1,470,070 and other heavy machinery and equipment from £1,006,717 to £1,706,042.

British India and South Africa also increased their imports of electrical machinery, etc. For instance, British India's purchases of generators rose from £454,434 to £1,613,498. In the machinery section there was a considerable fall in the value of Spain's imports of generators—from £686,533 to £41,554.

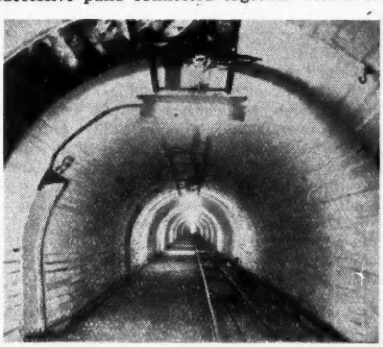
On the import side there was a very substantial decrease. This was almost entirely accounted for by much smaller purchases of radio equipment from Canada. Imports from the United States of electrical goods and apparatus were shown at £1,066,059, against £598,987 in 1946. Large increases were recorded for furnace carbons, lighting equipment, instruments and X-ray equipment.

Lighting in Coal Mines

Experimental Fluorescent Installations

THE development of the "Mazda" fluorescent lamp durig the war years led lighting engineers of the British Thomson-Houston Co., Ltd., to consider its application to underground workings. Experiments designed to test the suitability of this lamp for use in mines proved it to be not only safer than the tungsten lamp, but also better able to withstand the rigorous conditions. The company has now sent us some details of the progress which has been made.

The company planned the first experimental fluorescent lighting installed in a British coal mine, at Binley Colliery in 1945. Standard "Mazda" 80-W 5-ft fluorescent lamps in "Mazdalux" flameproof fittings were mounted beside existing tungsten lamp reflectors at the pit bottom. A comparison between the two forms of lighting showed that the fluorescent lamps provided a considerably greater degree of illumination than their tungsten counterparts. Further experiments followed, and specially designed fittings were used in Birch Coppice, Crown Farm and Merry Lees Collieries. From experience gained from these installations, a "Mazdalux" mines roadway fluorescent lighting fitting has been designed. This fitting is of cast aluminium alloy and is made either for single or double cable entry. A clear glass or "Perspex" cylinder encloses the lamp and all the necessary auxiliary gear is assembled and ready wired within the fitting. Two safety switches are incorporated in the circuit of the fitting, one mounted behind each lampholder. These switches are spring loaded and, immediately the lamp is fractured, they open and isolate the fitting from the mains supply. An experiment in coal-face lighting was carried out in 1946 at Birch Coppice Colliery, using special 15-W, 18-in. fluorescent lamps. The fittings formed part of a continuous cable system and were spaced at 12-ft (3·6-m) centres, suspended from props as close as possible to the roof. Pairs of fittings were permanently joined, and successive pairs connected together with cable couplings. Semicircular reflectors were incorporated in the fittings and these also served to protect the outer glass during shot firing.



Drift roadway, Merry Lees Colliery, fitted with fluorescent lamps in "Mazdalux" fittings

The results obtained were encouraging and the whole question of coal face lighting is now being investigated by a special committee of the National Coal Board, which has allotted five, out of a total of nine selected pits, to the company, to continue its experiments.

Batti-Wallahs' Society

THE Committee of the Batti-Wallahs' Society has considered reviving the ladies' night but has decided that conditions do not permit of a function of the standard the Society would hope for. It is thought that a ship may be chartered for a day's trip down river in the summer and this idea will be investigated.

A list of members cannot be reprinted at present but a short history and record of the Society is to be prepared for reproduction and circulation. The Society was founded in 1906 and six of the founder members are still members. New members have recently been accepted and the Society has largely retrieved the losses of the war years. Suitable candidates will be welcomed. Candidates must be electrical engineers who have had association with the sea through the Royal Navy, the Mercantile Marine or by a yacht or motor boat club. In addition to yesterday's lunch when Mr. J. A. P. Farrant was to speak on "Electricity in Ships;" lunches so far arranged are:—26th February, Chief guest Sir Gerald Woods Wollaston, whose subject will be "Heraldry"; 25th March, Chief guest Lt. Gen. Sir Charles J. S. King, who will talk on "The Royal Engineers."

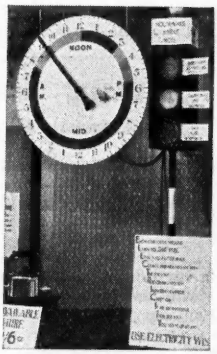
Pit to Power Station

AT a Manchester luncheon of the British Engineers' Association last week an address by Mr. Alfred Robens, Parliamentary Secretary, Ministry of Fuel and Power, was read in his absence on Parliamentary duties by Mr. A. F. Beal, senior regional officer, N.W. Region, of the Ministry. In his address Mr. Robens explained the power plant position and referred to the extension now proceeding at the Stuart Street station, Manchester, where a 60,000-kW set and two 400,000 lb per hr boilers are being installed. He said that the installation should be ready within the year. At the same time, advantage was taken of the re-organization of Bradford Pit by the National Coal Board to convey coal direct to the power station. Whilst this part of the programme would necessarily take longer to complete, it provided for an underground belt conveyor direct to the power station capable of carrying up to 200 tons per hour. The tunnel would be 530 yd (484 m) long and the total length of the conveyor 717 yd (655 m). The coal could be carried either to a stockyard or direct to the power station. The start on the driving of the tunnel was expected shortly, and the conveyor was scheduled to be in operation by mid-1950.

As new generating plant came into commission, the power situation would improve from year to year. Certainly there was no reason to fear a repetition of last year's crisis, when the coal stocks at the power stations were nearly exhausted. We were able to start this winter with double the coal stocks that we had last year. But the improvement in coal supplies did not mean that we were getting all the coal we needed. The coal that was being exported was only a token of what it is hoped to send later, besides expanding the coal consumption at home. Many members of the B.E.A. had an important contribution to make towards fuel efficiency through the supply of efficient fuel-burning equipment to home industry. This applied particularly to the makers of boilers and other plant, since fuel efficiency was an important selling point.

Fuel Economy Display

A WINDOW display at Huddersfield Corporation Electricity Department's showrooms, which has been designed to impress upon domestic electricity consumers the need for economy, particularly during peak periods, has aroused considerable local interest. The centre display of the window consists of a 24-hour clock dial



Central feature of the fuel economy window display at Huddersfield

and a model traffic signal. There is a colour band around the dial, red indicating the peak periods, amber "caution" periods, and green the times when electricity may be used normally. The pointer takes approximately half a minute to traverse the dial and as it passes over the colours, the traffic signal flashes the corresponding colour. Above the display is a banner appealing to housewives to keep local industries going by using as little electricity as possible during peak periods.

The left-hand side of the window shows the consumption of an immersion heater as 3 kWh per hour which is equvalent to 4 h.p. A loom, a 1-h.p. motor and a vacuum cleaner are also exhibited giving the equivalents of consumption to the immersion heater. On the right hand side of the window is a display of domestic appliances. These are "tied up" with a 100-W lamp and the equivalents of consumption are clearly indicated in each case. The display has been built and designed by various members of the staff of the Electricity Department.

All-Electric Coal Mine.—Good progress is reported in the sinking of the new pit, Kingshill No. 3, Lanarkshire, which will be all-electric on the surface and underground.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.

Electric Fires and Open Fireplaces

WHEN in a room fitted with an open grate an electric fire is used, the natural tendency is to place it right in front of the grate. This leads to waste, due to a portion of the convected heat being carried straight up the chimney; moreover, the unnecessarily high rate of ventilation produced by the ordinary flue makes for further avoidable losses.

There are two remedies: Blocking the fireplace opening by a screen and providing a damper. A screen-type electric reflector fire, recently advertised, seems to offer a good solution. The second alternative may be accomplished by the use of a new detachable damper, to be fitted at the top of existing fireplaces, though the primary object of this device is to effect a coal saving by reduction of the draught.

With new housing, when slow-combustion stoves are in use, by closing the fire doors the draught can be reduced to a minimum. Where so-called "closeable fires" are installed, however, provision should be made for dampers.

If we wish to claim a working efficiency of 100 per cent for electric space heaters, it is up to us to ensure that they are used properly. The electricity supply industry—probably through the E.D.A.—should arrange for intensified educational work and press for the provision of dampers in all existing open grates and new "closeable fires."

"ELECTRICUS."

Dangerous Installations

MY wife complained of "shocks" from the water pipes and on investigation I found a small earth fault had raised the potential of the earth wire and the piping to which it was connected. I made a new earth connection outside the house and asked the local electricity undertaking to have it tested.

The electrician who called pronounced it quite safe and satisfactory, but some time later this earth connection became sufficiently alive to produce violent shocks. I complained at once to the undertaking which sent another electrician, seemingly much more qualified than the first. He found that an earth-leakage breaker, always fitted in the district because of the difficulty of obtaining a good earth, had never been connected properly. The connections were altered to give correct operation and the system is now quite safe.

I suggest that consumers should be able to call on the services of a competent engineer at any time to check their installation and that this service should be given free. Furthermore, the existence of such a service should be made known to all consumers and they should be encouraged to make use of it.

"COUNTRYMAN."

RECENTLY I came across an instance in which the owner of an electric iron purchased a new element and fitted it himself, at the same time tightening the plug pins and replacing the broken mica washers with steel ones. The short-circuit blew one fuse—that on the earthed side—and the iron remained live; single-pole fusing is the answer.

Supply authorities could render an additional service at small cost by printing on their account forms a declaration, to be signed by the consumer, of any alterations or additions made to the installation since the meter was last read, the word "none" to be written if applicable. These alterations could then be inspected by the meter reader, who should be qualified to do so, on his next visit. This would avoid the necessity of appointing special inspectors, which might appear in headlines in the less enlightened section of the daily press as "Nationalized electricity brings further crop of snoopers." The regulations require such work in industrial installations to be carried out by competent persons.

Almost anybody can barge his way into electrical contracting. I have seen such shop signs as "Electrical Engineer and Stationer" and "Electrical, Radio and Television Engineer. Pianos Tuned." There seems to be plenty of scope in this direction for activity among those who suffer under the disability of being merely electrical contractors.

*London, S.W.*16. L. F. COUPLAND.

WHILE Mr. F. W. Purse gives perfectly good advice, I am afraid that the "medicine" prescribed will be hard to take and indeed it might do a *bona fide* contractor a great deal of harm. If every respectable contractor had to raise the matter of bad

installations I am afraid he would be doing little else and he might even be branded as a nuisance by some supply authorities.

It is difficult in a few words to state why Mr. Purse's medicine is unpalatable but this is the position briefly. Suppose a contractor is continually carrying out work for a large syndicate and one of the principals calls the contractor to his residence to investigate trouble. The contractor finds the installation in a disgraceful condition and reports accordingly, but the principal decides he is not going to spend the money on the necessary corrections. If the contractor then decided to "push things," he might succeed in obtaining business for a competitor and at the same time he would probably lose all the other work required by the syndicate.

The position is very unfortunate and unsatisfactory and until proper machinery is forthcoming to deal with dangerous installations (and they are numerous) in a practical manner, little headway can be made.

Glasgow, C.2. A. MILNE, SEN.

Technical Literature

I SHOULD be obliged if any of your readers could recommend from their own experience, some books that deal comprehensively with the theory and design of single-phase induction motors.

Bath. W. H. BOAKES.

Gauge and Tool Exhibition

Inspection Testing Equipment

APPLICATIONS of electrical methods in the engineering industry were illustrated by some of the exhibits at the Gauge and Tool Manufacturers' Exhibition, the second of its kind, which opened on Monday last at the New Hall, Vincent Square, London, and closes on 6th February.

Among the few electrical exhibits is the Cornelius electronic comparator shown by A. C. Wickman, Ltd. This instrument facilitates all the usual non-destructive inspection tests required in modern production engineering. Two identical pieces of metal placed in the field of the test coil modulate the frequency of that field in exactly the same way, producing identical readings on the instrument scale. Any divergence from the standard causes a variation of the reading. If the instrument is set at zero with a test piece of steel containing no nickel and then a bar containing 1 per cent nickel is passed through the test coil, this is sufficient to deflect the needle off scale. With the aid of various test heads it is possible to use this instrument for the comparison of chemical composition, hardness, dimensions and thickness of plating, as well as for the detection of cracks and flaws.

An electrically driven portable precision surface grinder manufactured by G. & W. Lowe, Sheffield, which may be operated by an unskilled man, is shown. In addition to flat surface grinding this tool is capable of producing grooves such as oilways of varying widths up to ¼ in.

"Sigma" inspection equipment for mass produced parts is exhibited by E. J. Jones, Ltd., London. These machines, which make use of electrically operated indicating systems, are suitable for multi-dimensional inspection up to the rate of 4,000 pieces per hour. The test pieces are sorted into "pass," "undersize" and "oversize," counted and ejected into appropriate trays below the machine. Coloured lights indicate the category of the particular piece under test at any time.

Birkenhead Power Station

Hydrogen-cooled Alternators

NEXT Monday the foundation stone of a 200,000-kW power station at Bromborough, Cheshire, will be laid. Preliminary arrangements were made by Birkenhead Corporation and the Central Electricity Board in 1939 but were suspended by the outbreak of war.

The post-war scheme provides for two 50,000-kW turbo-alternators to be installed by December, 1949, at an estimated capital expenditure for the first section of the station of £4,292,000 and for two 50,000-kW extensions costing £1,852,000 and £1,546,000 to be ready by March and October, 1950. The turbines will be three-cylinder 3,000-r.p.m. English Electric machines with five-stage feed-water heating and inlet steam conditions of 900 lb per sq in. and 950 deg F (63 kg per sq cm and 486 deg C); maximum continuous and most economical ratings will be identical. Circulating water will be drawn from the River Mersey. The alternators are to be hydrogen-cooled. Steam will be raised in eight pulverized-fuel Babcock & Wilcox boilers dealing with 510,000 tons of coal per annum at 65 per cent load factor. Main switching is to be at 132 kV by means of remote electrically operated 1,500-MVA bulk-oil circuit breakers.

Mr. T. V. Lironi is acting electrical engineer to the Corporation, which has appointed Merz & McLellan as consultants and, for civil engineering and architectural work, Sir Alexander Gibb & Partners.

Northampton Electrical Association

Between sixty and seventy members of the Northampton and District Electrical Association were present on 14th January when Mr. G. W. Godfrey, general sales manager of the Radio Division of E. K. Cole, Ltd., gave a talk on "Television," illustrated by slides.

COMMERCE and INDUSTRY

Cable Makers' Wages. Warning of Load Cuts.

THE Joint Industrial Council for the Electrical Cable Making Industry announces increases in wages to become effective on the third pay day in February in respect of the period for which payment is made on that pay-day. Adult male employees, both timeworkers and pieceworkers, will receive an increase of 1d. per hour and adult female employees (timeworkers and pieceworkers) will receive an increase of ¾d. per hour. In addition, a temporary bonus will be granted of ¾d. per hour to adult males and ½d. per hour to adult females who are remunerated solely on the minimum plain time rates agreed by the J.I.C. These bonuses will be cancelled if any scheme of incentives, compensatory bonus or lieu rates are introduced. Where lieu rates are already paid to timeworkers, the temporary bonuses referred to above, will be offset against such lieu rates. Proportionate advances in respect of both parts of the above will be granted to males and females under adult age. The Council has agreed to a revision of the wages structure of the industry which eradicates certain anomalies. This revision provides for a difference of ¾d. per hour between the various grades and the same amount between the two Districts.

Radio Relay Load Warnings

At Portsmouth the Municipal Electricity Service (engineer and manager, Mr. R. H. Coates) has arranged with the Portsmouth Radio Relay Service to warn its subscribers of impending load cuts. At present only about 10 per cent of the electricity consumers can be reached by this means, but with the extension of the relay service it is hoped in time to cover 20 per cent of the city load, or 10 per cent of the total load.

By means of a private telephone line from the generating station control room to the radio relay station a signal is given that the relay service is required. The relay operator fades out the programme and transmits a "warbling" note to indicate that an announcement is to be made. Then by means of a microphone the operator at the control room gives, first, a warning of voltage reduction and later, if necessary, announces that the supply is to be cut off from specified districts. At the same time consumers not affected are requested to economize to prevent further cuts.

English in Engineering

A booklet issued by A. Reyrolle & Co., Ltd., under the title of " A Few Notes on Words and Other Things " contains much that is likely to be of practical use to those who have to express themselves on paper but who have not had much experience in doing so. This relates in particular to an essay on the English language by Mr. Thomas Carter and to some notes on the best use of words, hyphens and abbreviations. The need for exactitude is further stressed in the same author's articles on Ohm's Law, which originally appeared in the *Electrical Review*. A section on electrical terminology by Mr. E. H. W. Banner, reprinted from the same source, discusses the importance of avoiding obsolete scientific and technical expressions. Definitions of electrical terms, based on the Standard Glossary, B.S.205: 1943, but indicating those found preferable in Reyrolle's experience, emphasize the need to use the same words to mean the same things.

Sequel to Liverpool Strike

Liverpool Electric Power and Lighting Committee has passed a resolution deploring the action of Clarence Dock power station employees who went on strike during the Christmas holiday against the wishes of the committee and of their own union. It is proposed to pay an honorarium to about fifty men who volunteered their services during the strike.

Bingley and the Five-Day Week

Bingley U.D.C. Lighting and Tramways Committee recommends that a strong protest be sent to the National Joint Council for the Electricity Supply Industry against the award of a five-day week of forty-four hours for day workers. The recommendation is made on the grounds that it does not allow any variation to meet requirements of individual undertakings.

Electric Vehicle Company's New Title

Associated Electric Vehicle Manufacturers, Ltd., have changed their name to Austin Crompton Parkinson Electric Vehicles, Ltd. At 16th May last, 140,502 shares of £1 had been issued, of which Crompton Parkinson, Ltd., and Austin Motor Co., Ltd., each held 70,251.

Education and Industry

The willingness of industry to co-operate with education authorities is demonstrated by an experiment at Birmingham. One of the Perry Barr Council Schools has arranged to take parties of the older boys to various Birmingham factories where, by seeing for themselves how things are made, the pupils are not only given an opportunity to increase their general knowledge, but to study conditions of employment that will prove invaluable when the time comes for them to choose their own career. The experiment has the approval of the Birmingham Education Committee and is being watched closely by the Birmingham Chamber of Commerce. As part of the experiment, a party of

forty of the boys recently visited the works of George Ellison, Ltd., and were shown the incoming raw materials and the various stages in the manufacture of electrical switchgear in the tool rooms, machine shops and assembly bays.

Paint Finishing Exhibition

A display "How Paint Helps Exports," designed to assist industrialists in "regrooming" their products for export markets, was opened by Mr. A. G. Bottomley, Secretary for Overseas Trade, at the Charing Cross Hotel, London, on 26th January. This display, by the Paints Division of I.C.I., illustrates how modern finishing techniques can impart sales appeal and protection to the product at low cost. A new sound film in colour, "The Technique of Spray Painting," will show some of these methods in operation. The display remains open until to-morrow (Saturday) evening.

Starting Diesel-Electric Locomotives

The first main-line locomotive to use diesel-electric propulsion for passenger service in this country, the 16-cylinder, 1,600-h.p. unit now undergoing final trials on the former L.M.S. system, is electrically started from a 120-V, 236-Ah D.P. "Kathanode" battery. This type of battery has previously been tested in the heavy-duty service called for in starting the thirty-seven diesel-electric shunting locomotives in use on the major home railway systems. Others in course of manufacture include twelve for main-line units and fifteen for shunters on the Egyptian State Railways, fifteen of rather smaller capacity for shunters on British Railways and twenty for the Federated Malay States.

Broadcasting Jubilee

To mark the silver jubilee year of the B.B.C. an illustrated booklet entitled "Twenty-five Years of British Broadcasting," has been published, covering the years 1922-47 and giving the reader an introduction to every phase of broadcasting activity, including television. The booklet costs 2s. 3d., post free, and may be obtained from the B.B.C. Publications Department, Grammar School, Searle Road, Wembley.

Garcke's Manual

The forty-fifth edition of Garcke's "Manual of Electrical Undertakings and Directory of Officials" has just been published. With the forthcoming changes consequent upon the nationalization of the industry, much of the matter contained in the present edition appears for the last time. A preface to the volume, however, indicates that this work of reference will continue its usefulness in future years although its appearance will of necessity be altered to suit changing circumstances.

The 1947-48 edition follows the lines of previous editions and contains the financial, engineering and supply statistics of all electricity undertakings in Great Britain and Ireland. This year's edition also contains the latest particulars at the time of going to press of the British Electricity Authority and the Area Electricity Boards.

The Manufacturers' Section of the electrical and allied trades, contained in pre-war issues, makes a welcome re-appearance and the directory of officials has been amplified and revised to date. The volume is published by the Electrical Press, Ltd., 23, Great Queen Street, London, W.C.2, at £3 3s.

Post Office Awards

During the quarter ended 30th September, sums totalling £388 were granted to Post Office servants in respect of 150 suggestions submitted for improving the services. Most of the suggestions related to telecommunications apparatus, material and services and were made by engineering personnel. The highest award was £50 for a suggested modification to apparatus used in connection with voice frequency unidirectional signal line circuits.

Fluorescent Office Lighting

A modern fluorescent lighting system has recently been installed in the offices of the British Metal Corporation, Ltd., Gresham Street, London. The equipment was supplied by the British Thomson-Houston Co., Ltd., whose lighting engineers planned the installation. The installation work was carried out by Troughton & Young, Ltd.

New Metrovick Factory at Stockton

Work for about 600 men and women is to be found in the factory to be opened at Stockton-on-Tees by the Metropolitan-Vickers Electrical Co. for the manufacture of electric generators and diesel locomotives.

Brush Turbine Contracts

Recent orders received for the Brush Electrical Engineering Co.'s new range of turbines include one from P. Kveldulfur, Ltd., of Reykjavik for a back-pressure turbine for installation in the Hjalteyri herring factory on the north coast of Iceland. The plant includes a 1,250-kW, c.m.r., 6,000-V, three-phase, 50-cycle 0·7 p.f. turbo-alternator operating at 385 lb. per sq in., 610 deg F (27·07 kg per cm^2, 321 deg C) against a back pressure of 80 lb per sq in. (5·6 kg per cm^2). A three-panel h.v. switchboard is included for controlling supply to two 900-kVA, 6,000/220-V, three-phase, 50-cycle transformers. The l.v. output is controlled by a nine-panel board and sub-distribution boards.

The Valley Room & Power Co. at Nelson has ordered an axial flow pass-out turbine of 1,875 kW output. The operating conditions are 200 lb per sq in., 650 deg F and 28 in. vacuum

(14·06 kg per cm², 343 deg C and 711 mm). The pass-out quantity of steam is 35,000 lb per hour at 22·5 lb per sq in. gauge (15,876 kg per hour at 1·58 kg per cm²). The alternator is designed for operation at 500 V, 50-cycles, three-phase, 0·8 p.f. A Brush 16-panel switchboard has been ordered with this set to control the existing sets (one Brush Ljungström and one Parsons) and the incoming feeders from Nelson Corporation electricity supply.

Mobile Crane Accident

Returning a verdict of " accidental death " on three men killed when working with a mobile crane erecting prefabricated houses at Newcastle-on-Tyne, the coroner, Mr. D. Appleby, said there was no evidence to show how the accident happened. The men were working on the erection of an aluminium house on a site over which passed a high-voltage cable. There was no evidence to show that the crane jib had touched the cable, but electricity ran through the crane and electrified a section of the aluminium house the men were holding. Walter Ellis who was in charge of the work said that when the accident occurred the jib was 2 or 3 ft from the cable. It was stated that the cable operated at 66,000 V. A Government Inspector of Factories said that the jib must have touched or come very close to the overhead line.

Iron and Steel Control

The Ministry of Supply has made the Control of Iron and Steel (No. 62) Order, and the Control of Bolts, Nuts, etc. (No. 15) Order, which came into force on 28th January. The former Order consolidates with amendments all previous Orders other than Scrap Orders. The other Order increases maximum prices for a limited range of steel bolts, etc.

Zinc Licences Suspended

The Ministry of Supply announces that the granting of licences by the Directorate of Non-Ferrous Metals for the acquisition of unwrought zinc is suspended for the time being, pending provision of the statutory selling prices of zinc.

Electric Vehicles in Poster Advertising

Mills & Rockleys, Ltd., outdoor advertising contractors, are now operating a fleet of electric vehicles, in conjunction with motor vehicles, for certain outlying areas. Few hand carts are now used by the company.

Before adopting electric vehicles a survey was carried out with the assistance of Crompton Parkinson, Ltd., who at that time were responsible for the " Morrison-Electricar " vehicle, now being manufactured and marketed by Austin Crompton Parkinson Electric Vehicles, Ltd. This showed that considerable economies in time, labour and costs, could be effected by the use of electric vehicles and the company now has a number of 10-cwt pay-load vehicles supplied by Crompton Parkinson, Ltd.

Certain additional work was necessary to make the bodies suitable for the equipment which has to be carried. Ladder fixtures of a quick release type operated by one hand were affixed to the roof and removable bins incorporating shelves were fitted to the sides of the body to hold posters. At the rear there is a 15-gallon paste container so arranged that the tap is easily accessible, by withdrawing the container on slides over the tail board. Many of these vehicles have been in operation for a considerable period and an analysis of operating costs shows that the anticipated economies have been more than realized.

Crompton Parkinson Acquisition

Crompton Parkinson, Ltd., have acquired a controlling interest in Cooke & Ferguson, Ltd., electrical welding and general engineers, of Victoria Street, Higher Openshaw, Manchester.

St. Pancras Wiring Staff

The St. Pancras Electricity and Public Lighting Committee has recommended the transfer of the wiring staff at present covered by the schedule of the N.J.I.C. for the Electrical Contracting Industry to the rates of pay and conditions of wiring staff under the agreement of the N.J.I.C., Electricity Supply Industry. The change in the case of those engaged on shift work would operate from the first full pay period after 1st October, 1947, and for contracting wiring staff from the first full pay period in February, 1948. The estimated additional cost to 31st March next is £195 for shift and maintenance men and £90 for wiremen on contracting work.

Cape Town Students Visit Works

Sixteen students from the Engineering School of the University of Cape Town recently inspected the works of the Automatic Telephone & Electric Co., Ltd., Liverpool, and British Insulated & Callender's Cable Co., Ltd., at Prescot.

Laboratory Practice Information

The governors of the College of Technology, Manchester, have offered facilities for the operation of a scheme for the interchange of information on teaching and laboratory practice in engineering. It is proposed to issue several times a year a bulletin in which will be given a brief account of laboratory experiment designs submitted by individual teachers. Each design will be accompanied by the name of the teacher concerned and the college with which he is associated. At the same time the teacher concerned will be asked to submit a detailed description and four copies of constructional drawings together with additional information which he thinks desirable. This information will be filed and made available free on loan to any teacher interested. In this way it is hoped

to build up a library of designs for which the bulletins will form an index and summary. For the time being the scheme is being restricted to electrical engineering laboratory experiments approximating to the standard of the A1 and A2 years of the H.N.C. course, or of degree courses. Dr. E. Bradshaw, of the Electrical Engineering Department of the College of Technology, Manchester, is acting as organizer of the scheme.

Domestic Water Heating

The British Electrical Development Association has produced a booklet for architects, borough surveyors and others concerned in the installation of water heaters in new houses, outlining the essential points to be observed in the interests of economy of electricity and fuel. Briefly these principles are that the hot storage vessel should be effectively insulated with a 3-in. thickness of approved insulating material; all circulation of electrically heated water should be avoided whether it be through the boiler flow and return piping or through towel rails or radiators; the length of " dead legs," particularly that to the sink tap, should be reduced to the minimum; " single pipe " circulation in draw-off or vent pipes should be avoided; and airing cupboards should not be heated by leaving part of the hot storage vessel uninsulated. The booklet states that provided attention is paid to these points, an electric water heating installation will give an automatic constant hot water service of such high efficiency that the consumption of electricity is, for all practical purposes, in direct proportion to the amount of hot water used.

Trade Announcement

The P.D.N. Castle Engineering Co., Ltd., 87, Pembury Road, Tottenham, N.17, has been appointed the London area representative for J. Bateson, Ltd., electrical and mechanical engineers, Halifax.

Changes of Name

D. & S. Electrical Products, Ltd. have changed their name to D. H. S. Electrical Products, Ltd.

Trafalgar Batteries, Ltd. have become Iping Batteries, Ltd.

Trade Publications

Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, W.C.2.—Revised price list of miners' bulbs.

Record Electrical Co., Ltd., Broadheath, Altrincham.—Leaflet on flameproof moving-iron instruments.

Pifco, Ltd., 59-63, Great Eastern Street, London, E.C.2.—Catalogue of general electrical and cycle accessories and equipment. Also two leaflets illustrating a range of moving-coil instruments and the " Pifco " adjustable desk lamp.

Muirhead & Co., Ltd., Beckenham, Kent.—Priced folder descriptive of a portable pH meter, direct reading for use with glass electrodes, based on the constant grid current electrometer circuit.

Linealux, Ltd., 142, Liverpool Road, London, N.1.—Catalogue of industrial and domestic lighting fittings and accessories.

Wardle Engineering Co., Ltd., Old Trafford, Manchester, 16.—Leaflet on fluorescent lighting fittings and accessories.

Change of Address

The address of the Engineers' Guild is now 28, Victoria Street, London, S.W.1 (telephone: Abbey 6511).

Trade Marks

APPLICATION has been made for the registration of the following trade marks. Objections may be entered within a month from the dates given:—

14th January

TRICLAD. No. 655,012, Class 9. Electric accumulators.—Chloride Electrical Storage Co., Ltd., Exide Works, Clifton Junction, near Manchester.

AEROMAX (design). No. 652,852, Class 10. X-ray tubes and housings therefor, all used for diagnostic, therapeutic, etc., purposes.—Machlett Laboratories Inc., Connecticut, U.S.A. Address for service: c/o Cruickshank & Fairweather, 29, Southampton Buildings, Chancery Lane, London, W.C.2.

FRANSEL and FRANSELLA. Nos. 648,871 and B648,872 respectively, Class 11. Lamps for domestic use, lampshades, lampshade holders and lamp standards.—Franco-British Electrical Co., Ltd., 15-17, King Street, St. James's, London, S.W.1.

THERMOLUX. No. 652,748, Class 11. Electric cookers.—McDonald, Engineers (Kirkcaldy), Ltd., 20, South Street, Leven, Fife.

21st January

NOMAD. No. 652,951, Class 7. Electric generators for pedal and motor cycles.—McKinlay Electrical Mfg. Co., Ltd., 75, Upper Richmond Road, East Putney, London, S.W.15.

SOLACHROME. No. 653,923, Class 9. Electric kettles.—F. J. Tomlinson, Ltd., Hall Carr Mill, Rawtenstall, Rossendale, Lancs.

CAMBURN. No. B654,225, Class 9. Alarms, alarm systems, electrical apparatus and instruments included in Class 9, wireless apparatus, and fire extinguishing apparatus.—D. McN. Cochrane and A. C. Mitchell, trading as Camburn Alarm Systems, 725, Gallowgate, Glasgow, E.1.

ALDEX. No. 654,760, Class 11. Electric heating apparatus, electric stoves, fans and cooking utensils included in Class 11.—Aldersgate Engineering & Construction Co., Ltd., Stoneyholme Mills, Grosvenor Street, Burnley, Lancs.

PARLIAMENTARY NEWS

By Our Special Reporter

IN the House of Commons last week Mr. Erroll moved that the Control of Turbo-Alternators (No. 1) Order, 1947 (S.R. & O., 1947, No. 2386) should be annulled. He said that the purpose of the Order was to achieve the standardization of the sizes of large turbo-alternators intended for this country. The standardization was intended, so far as could be understood, to speed up manufacture and because it was not now so necessary to make individual generators of particular sizes to meet the needs of particular localities. The intention was quite laudable but the method of execution was deplorable. There were only about twelve manufacturers of large turbo-alternators in this country, and there was only one customer in this country—the British Electricity Authority. Surely it should have been possible to have obtained the effect of this Order by agreement between them. Nevertheless, the method of compulsion was adopted and it was compulsion of a particularly reprehensible character, because the Order was retrospective in its effect. As a result of the Order, manufacturers would have to modify or, in some cases, cancel sub-contracts already placed for supplies of components and materials, and a great deal of loss or inconvenience would undoubtedly be caused.

Sir John Mellor seconded. He said that the effect of the Order was to invalidate a large number of contracts made between November, 1946, and November, 1947. It should therefore be annulled as being *ultra vires*.

Mr. J. Jones, Joint Parliamentary Secretary, Ministry of Supply, said that the Order was introduced in good faith for the specific purpose of producing the greatest amount of power at the earliest possible moment and at the cheapest possible rate. To some extent, there had been a measure of agreement with regard to the need for standardization, but there had been no real progress. This Order would expedite delivery of generating plant by something like six or nine months.

Consultation had taken place in a friendly atmosphere and a most careful and detailed examination of the whole project was made before a decision was taken. Manufacturers themselves were consulted and were given some idea as to what the draft would be and they agreed. The Order was so designed as to create the least possible amount of disturbance, having regard both to the manufacturers' point of view and to the country's economic position.

In the case of an extension to an old plant, where the new standard could not be synchronized with existing plant, then the Minister had power to license the production of a non-standard set or part of a set. With regard to any new venture, where it could be proved to the satisfaction of the Minister's advisers that it was impossible for the standard to meet the requirements of a particular part of the country or industry, licences would be willingly and readily granted to allow a non-standard set to be proceeded with.

Sir F. Soskice, Solicitor-General, said that in his opinion the Order was undoubtedly not retrospective. What the Order said was that from the time the Order came into force, no further manufacture should continue; in other words, manufacture should stop. That did not make illegal anything entered into before the Order came into force, nor did it invalidate any contract. It was purely prospective in its effect.

The motion was negatived by 199 votes to 23 —Government majority 176.

National Boards

Mr. Erroll asked the Prime Minister if he would state the names of individuals who had been appointed to more than one national or regional board of a nationalized undertaking or State corporation of a commercial character; and the nature of such duplicate appointments, together with details of individual salaries and allowances paid.

Mr. Attlee said that five gentlemen were at present members of the boards of more than one undertaking of the kind described, including Mr. George Gibson who was chairman of the North Western Electricity Board (salary £4,000) and a member of the Court of Directors of the Bank of England, in respect of which he received no salary; Mr. Tom Johnston who was chairman of the North of Scotland Hydro-Electric Board (salary £1,000, not drawn by the present holder) and also *ex officio* a part-time member of the British Electricity Authority (salary £1,000, not drawn by present holder); and Alderman I. J. Hayward who was part-time member of B.E.A.C. (salary £1,000) and of the London Electricity Board (salary £750).

Except in the case of Mr. Johnston (who received an expense allowance of £200 per annum in lieu of salary) no allowances were paid to any of these gentlemen who might, however, claim reimbursement of expenditure incurred in the business of the undertakings.

Telephones Installed

In reply to Mr. Edward Evans the Postmaster-General (Mr. Paling) said that 379,520 telephones were installed in 1938, and 624,809 in 1947.

Purchase Tax on Batteries

Mr. Turton asked the Secretary to the Treasury whether purchase tax was being refunded in respect of high-tension batteries

purchased after the last Budget announcement and before the proposal for the increase of tax was abandoned.

Mr. Glenvil Hall replied in the negative.

Gas Bill

On 21st January Mr. Gaitskell introduced the Gas Bill which provides for the setting up of Area Gas Boards and a Gas Council to acquire all the existing undertakings. Details are given on page 156 of this issue. The Bill was given a first reading.

Restriction on Appliances

Viscountess Davidson asked the Minister of Fuel and Power by what authority electricity undertakings restricted the consumption of electricity by owners of new houses and new occupiers of old houses to appliances using 500 W or under.

Mr. Gaitskell said that there was no general restriction but he understood that where the lines and transformers were likely to be overloaded consumers had been asked not to connect apparatus which made a heavy demand on the supply system.

Generating Capacity

Mr. Gallacher asked the Minister of Fuel and Power by how much generating capacity and power stations would be increased by 1950; and what percentage increase this represented of the plans made by the Central Electricity Board.

Mr. Gaitskell said that the net increase in generating capacity during the period 1948-1950 inclusive should be about 3,750,000 kW. This represented nearly 80 per cent of the increase planned by the Central Board.

Electricity Supply Position

On the motion for adjournment last Friday, Mr. A. M. F. Palmer drew attention to the unsatisfactory electricity supply position in this country. He controverted the general impression that the present demand for electricity had arisen from wartime expansion showing that normal expansion would have been greater.

The cutting-down of the power station programme involved serious risks. The Minister of Fuel and Power had said that electricity was too cheap but the danger was that it might soon be far too scarce. The load-staggering scheme had not yet been seriously tested owing to the mild weather; if there were a cold dark morning next week it would be essential to shed about a million kW of load.

While the Government could not be blamed for the deficiency it would be blamed if it failed to remedy it. We needed six million kW of plant during the next four years to make up the deficiency and meet expanded demand and yet it was proposed to install only five million kW—with a small contribution from the North of Scotland. If we were unable to attain the "target" the situation would be impossible. He (Mr. Palmer) was told that in many cases, while the electrical plant was ready, the boiler plant was behind schedule. Was the Minister confident that the estimates of production would be realized?

After Mr. Drayson had drawn attention to the lack of plans for electrification of rural areas, Mr. Robens, Parliamentary Secretary to the Ministry of Fuel and Power, replied. He agreed that the situation was serious and referred to the enormous increase in domestic consumption. By load staggering they had managed to transfer between 750 and 1,000 MW from the peak; that was probably the most that could be done without serious dislocation. He also agreed that the plant commissioned between 1st July, 1945, and 31st December, 1947 (817 MW) was a very small contribution to what was required.

The cut in the programme from 2,000 to 1,500 MW for 1950 and 1951 was an estimate. No one could say with certainty what our general industrial development might be in the next two years. Obviously even those figures must be subject to review and he hoped that progress in production would permit wider and more generous estimates. It was calculated that in 1951-2 we should have a margin over demand of about 500 MW and this should reach 890 MW in 1952-53.

The completion of the new plant in time depended upon the supply of steel; all other shortages had been overcome.

Marine Echo-sounding

MEASURING the depth of water by means of electrical echo-sounding equipment has been a practical possibility since 1912 and was first employed in the hydrographic service of the Royal Navy in 1924. The requirements and progressive improvement of equipment are outlined in Admiralty Bulletin No. 4, which also mentions standardized recording sets and wartime developments. Modernized equipment has been made and tested, but is still regarded as an interim type; the need for an improved beat set is also urgent.

A prototype of the latest ship set has been on trial for a complete survey season and soundings down to 1,000 fathoms have been recorded under adverse conditions. It derives its power from a frequency governed motor alternator, which is controllable over a frequency range corresponding with the sounding velocities employed. Transmission is controlled by a gas discharge device, which has replaced the original contactor-relay system. The magneto-striction oscillators employed as transmitters and receivers have been improved and are fitted in tanks lined with sorbo rubber to minimize direct interference. The recorder is now driven by a synchronous motor from the controlled frequency source. The boat set, of the same basic design, but energized from a 12-V source, has recorded down to 150 fathoms.

ELECTRICITY SUPPLY

Glasgow Distribution Re-arrangement. Development in India.

Bradford.—SUPPLY FAILURE.—Water which had been fed by the N.F.S. on to a fire at a sack and bag makers' premises in Listerhills Road on 22nd January penetrated an electricity feeder and caused an explosion which resulted in a three-hour failure of the supply in the Listerhills and Gracechurch Street areas.

Hackney.—PREPAYMENT WASH-BOILER SUPPLIES.—Before the war 116 wash-boilers were installed in new blocks of L.C.C. flats, with slot-meters to enable each of them to be used by a number of tenants. The tariff originally fixed was ½d. per kWh, later raised to ½d., at which figure it remained because spare parts for recalibrating the meters were not available. The parts having now been obtained, it is proposed to increase the tariff to ¾d. per kWh.

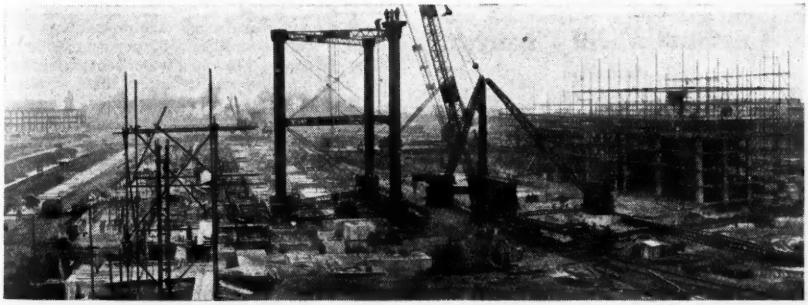
Glasgow. — DISTRIBUTION SCHEME. — The manager of the electricity undertaking has reported that when the Braehead generating station comes into operation it will be possible to re-arrange the 20-kV distribution system in the south-west area, and he has submitted proposals under which four 132-kV main transmission lines would be laid from Braehead to Govan substation, where energy would be stepped down to 20 kV for general distribution. Certain existing cables would be replaced, a new substation erected at Cessnock and the existing substation at Govan and Langside extended. It is not expected that the work would commence before the vesting of the undertaking in the British Electricity Authority, but it is necessary that the consent of the Electricity Commissioners should be obtained so that orders may be placed to ensure completion of the work in time to deal with the power station load. The Electricity Committee has approved of capital expenditure totalling £901,800, and has instructed the town clerk to make application to the Electricity Commissioners for approval. The principal items are £515,700 for underground mains, £350,200 for distribution plant and £34,900 for buildings.

Hebburn-on-Tyne. — HOUSE WIRING. — The Urban District Council is considering plans for installing electric lighting in 125 houses at a cost of £743 and for installing two-way switches in 134 houses (£435).

Hornsey.—SUPPLY TO COUNCIL HOUSES.—The Electricity Department is to spend £6,966 on providing low-voltage mains to new Council houses and flats.

FUEL ECONOMY.—Hornsey's electricity economy campaign, including "Target" and "Keep It Up" leaflets and an exhibition at a local cinema, has cost £165 and a claim for a reimbursement of this sum is to be submitted to the Ministry of Fuel and Power.

Islington.—IMPROVED LIGHTING PLANS.—In September last the Council approved a scheme for the experimental lighting of a section of Holloway Road by fluorescent lamps and the sanction of the Ministry of Transport has since been received. A report by the Electricity Committee says it is understood that the Ministry is prepared to consider the improvement of the lighting along the remainder of Holloway Road from Highbury Corner to the borough boundary in Archway Road. Any such scheme is to be submitted in four parts for consideration as to the degree of expenditure which might be permitted at present. The engineer and manager has accordingly submitted proposals for mercury vapour lighting in four sections of the road. The total estimated cost is £7,416, but this is dependent on the work being carried out concurrently with the scheme already approved. The electricity undertaking would bear the cost of increasing the voltage



General view of the new Croydon "B" power station in the course of erection. On the right can be seen the electrostatic grit precipitator casings, and in the centre the sub-structure, 60 ft high, which will be for a 20-ton travelling derrick

from the present 100 V between Highbury Corner and Camden Road. More than twice the existing illumination would be provided at a loading of 52·7 kW against the present 80·1 kW.

Overseas

India.—ELECTRICAL DEVELOPMENT LEGISLATION.—The adoption of a grid system, with the establishment of Provincial Electricity Boards, is proposed. Shri N. V. Gadgil, Minister of Works, Mines and Power, indicating the vast electrical development that lay before the country, said that, while the possibilities in India from hydro-electric sources alone might produce more than 35 million kW, the total installed capacity at present was below 2 million kW. Again, the annual per capita consumption in India was 9·2 kWh as against 906 kWh in England; 1,470 kWh in the United States; 3,090 kWh in Norway; and 3,510 kWh in Canada. The Electricity (Supply) Bill, 1948, does not set out to nationalize the industry but only to control it at this stage. It enables the Provincial Boards to introduce many of the benefits of nationalization without its being necessary to make prodigal use of public borrowing power to acquire assets already being efficiently operated by private enterprise. New undertakings will, however, be started mostly by the State and only when it is impossible for the State to come in, will private enterprise be allowed. Out of the 412 electricity undertakings in India, 300 belong to private companies, 249 of them in the Dominion and 51 in the States. Calculated in terms of installed capacity, 73·19 per cent belongs to privately owned companies and the rest to municipalities and Government.

Customs Tariff Changes

Australia

UNDER the Geneva Tariff Agreement the Australian authorities have revised the duties on a number of classes of goods. Among the electrical equipment affected are the following:—A.c. watt-hour meters (two-rate, and two-rate and three-element combined) remain free under the British preferential tariff; under the most-favoured-nation tariff the duty is reduced from 12½ to 10 per cent *ad valorem*. The preferential duty on other watt-hour meters remains at 6s. 8d. each, but the m.f.n. rate falls from 13s. 4d. to 11s. 8d. Measuring and recording instruments not elsewhere specified are still admitted free under the preferential tariff; the m.f.n. duty is reduced from 12½ to 10 per cent.

The duties on certain cables are revised as follows:—Weatherproof braided aerial cable from 15 to 12½ per cent preferential, remaining at 27½ per cent under the m.f.n. tariff; telegraph and telephone cables, p.i.l.c., from 20 to 17½ per cent preferential and from 40 to 37½ per cent m.f.n.; ditto with further protective covering from 20 to 17½ per cent and from 35 to 32½ per cent respectively.

The duties on radio valves, including rectifier types, remain at 4s. 3d. each or 17½ per cent preferential, but are altered from 6s. or 35 per cent, to 5s. 6d. or 35 per cent (whichever is the higher) under the m.f.n. tariff. Electric smoothing irons remain at 5s. each under the m.f.n. tariff, but the *ad valorem* rate falls from 50 to 45 per cent; the preferential duty is reduced from 27½ to 22½ per cent. The duties on electrical insulating sheets are now 17½ per cent preferential and 37½ per cent m.f.n., against 22½ and 42½ per cent.

India

The *Board of Trade Journal* for 17th January contained schedules of classes of imports (*a*) which the Government of India will license freely for imports from dollar sources; (*b*) which it will license freely from non-dollar sources; (*c*) for which licences will not be granted; and (*d*) for which licences valid for one year will be issued. A number of electrical classes are included in each category.

Ceylon

Among the modifications of the customs tariff instituted by the Ceylon Government in December and published in the *Board of Trade Journal* are the following:—Electrical accumulators and batteries (with certain exceptions for automobile batteries), alternators, dynamos, exciter generators, control and switchgear, preferential rate 10 per cent, *ad valorem*, general rate 20 per cent; electric lamp bulbs, 17½ and 27½ per cent; electric lighting accessories and electrical goods and apparatus not elsewhere specified, 17½ and 27½ per cent; heating and cooking apparatus, irons, vacuum cleaners and washing machines, 50 and 60 per cent; electric wires and cables, 17½ and 27½ per cent; telegraph and telephone apparatus other than wireless, 25 and 35 per cent; refrigerators (domestic, complete), 95 and 100 per cent; (parts), 90 and 100 per cent; refrigerators (other) (complete), 40 and 45 per cent; (parts), 35 and 45 per cent; wireless goods and apparatus, 45 and 50 per cent.

Egypt

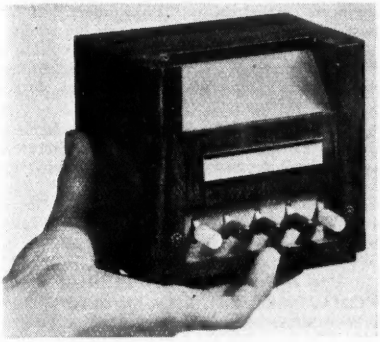
To implement its undertaking to relax restrictions upon imports from the sterling area, the Egyptian Government is to place before the Legislature proposals for an open general licence system. In the meantime licences are to be freely issued for the importation of a wide range of goods included in the open general licence list, including generators, motors, transformers, cables, electric locomotives, accumulators, electro-medical apparatus, radio and telephone and telegraph equipment and carbons. A second list stipulates articles for which individual licences will still be necessary when the new arrangement is in force; these include electric lamps, radio sets and "electrical apparatus and parts" (tariff item No. 792).

RECENT INTRODUCTIONS

Notes on New Electrical and Allied Products

Inter-office Communication

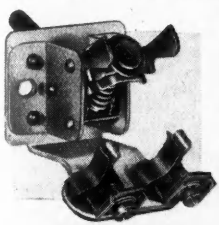
A LOUDSPEAKING inter-office communicator announced by HADLEY BROTHERS, 587, Bearwood Road, Smethwick, 41, Birmingham, enables people at up to seven points to communicate with each other by the simple



Loudspeaking inter-office communicator

depression of switches, without an exchange or dialling. Calling is automatic with indication of engaged positions and privacy of conversation; optional priority over all calls is provided for the principal.

The mains-energized amplifier-control unit in a metal case may be placed in any convenient position and connected by multi-core cable with seven polished wood sub-instruments each measuring 6 by 5 by 4 in. (15·24 by 12·7 by 10·16 cm) designed to stand on a desk or for wall mounting. The sensitivity of the amplifier can be adjusted and provision is made for on-off switching and pilot lamp indication at a distance.



Robust kick-dolly switch of skeleton construction

Kick-type Switch

A sturdy foot-actuated switch with a 15A at 250V rating and of skeleton construction is being specially made for the EDREX (EXPORT) CO., Audrey House, Ely Place, London, E.C.1. It is of familiar design to the usual specification for two-hole bolt fixing, having a kick-type dolly and mica insulation. This switch is available on reasonably short delivery terms only to manufacturers who embody a rough-usage switch of this kind in the appliances they make, with preference to exporters.

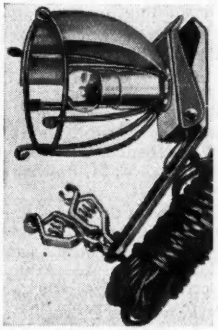
Safety Devices for Welders

A safety device in the form of a timed relay for protecting arc welders when changing the electrode in the holder of transformer-type plant is available from MUREX WELDING PROCESSES, LTD., Waltham Cross, Herts. It is inserted between the electrode holder and the output terminals of the transformer, the purpose being to reduce the output voltage automatically to 30 V, which is considered safe, without manipulation by the operator. The effect of breaking the welding arc is to cause the relay, after a short time delay, to introduce an auxiliary circuit. Full welding output is restored immediately, without time lag, when the electrode is touched to the work in the normal way. The relay device is small; it can be a separate unit, or attached to the transformer tank, or mounted on the wall.

To prevent spatter upon the coloured filter glasses of operators' helmets and hand screens from interfering with visibility and so causing bad welding, front covers of a special grade of "Perspex" have been introduced by this company. They can be cleaned by periodical light polishing and have a longer useful life than glass protectors, being also much less breakable.

Vehicle Inspection Lamp

An inspection handlamp, the "Baby Gripper," is becoming available in limited numbers from the BRITISH CENTRAL ELECTRICAL CO., LTD., 6, Rosebery Avenue, London, E.C.1. It is intended to be carried as part of the accessory equipment of a motor vehicle and to be operated from the car battery. To the spring grip is attached a spot-welded wire guard which also serves to hold an adjustable reflector, while the lampholder accommodates a standard car size side or tail lamp bulb. The flexible p.v.c. lead terminates in two crocodile clips for direct connection to the vehicle battery terminals. It weighs less than 5 oz (0·14 kg) and is cellulose enamelled.



Low-voltage "Baby Gripper" handlamp for car users

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Johnson, Matthey & Co., Ltd., are issuing £1,000,000 3½ per cent unsecured convertible loan stock at £98½ per cent. Of this amount £248,444 is being offered by way of conversion to holders of 4 per cent debenture stock due to be redeemed at par on 31st March next. The balance is being offered to shareholders and debenture holders of the company. Holders of the new loan stock have the right up to 28th February, 1953, to convert all or part of the holding into fully-paid ordinary shares at the rate of £1 ordinary share for every £3 12s. nominal of loan stock.

The Yorkshire Electric Power Co., has announced a final dividend of 6 per cent, maintaining the distribution for the year at 9 per cent.

New Companies

A. F. Bulgin & Co., Ltd.—Registered 20th January. Capital, £100. Manufacturers of, and dealers in, wireless receiving and transmitting apparatus, electrical, photographic and other equipment, etc. Subscribers: M. O'Nion and W. Veal. Solicitors: Theodore Goddard & Co., 5, New Court, W.C.2. (This week the new company announced the acquisition by a financial house of 800,000 1s. stock units at 2s. 4¾d. each. These are being placed on the market at 2s. 6¾d. each.)

Pritchett Manufacturing Co., Ltd.—Registered 17th January. Capital, £2,000. Manufacturers and dealers in metal contacts and electrical and mechanical goods and accessories, etc. Directors: E. H. Hill (director of Electric Depot, Ltd.), E. C. Smolka, J. Foster, and T. P. Carter. Regd. office: Daimler House, Paradise Street, Birmingham, 1.

Heaton Grogan Co., Ltd.—Registered 17th January. Capital, £1,200. Manufacturers and dealers in electro-medical, scientific and general appliances, etc. Directors: S. W. Grogan, W. L. Heaton, G. T. Brookes and C. J. Daniel. Regd. office: 21, Bowling Green Lane, Clerkenwell, E.C.1.

Coldpoint Co., Ltd.—Registered 17th January. Capital, £10,000. Manufacturers and installers of refrigerators, refrigeration appliances, etc. Subscribers: A. Ashton and H. Slater. Secretary: W. A. Duckworth. Solicitor: J. S. Carr, 283, Glossop Road, Sheffield.

J. Taylor (Electrical Contractors), Ltd.—Registered 16th January. Capital, £2,000. Directors: J. Taylor (permanent managing director), J. L. Taylor, and F. Brogden. Regd. office: 106, Deane Road, Bolton.

B. J. M. Stern, Ltd.—Registered 15th January. Capital, £20,000. Objects: To carry on the business of manufacturers of, and dealers in, refrigerators, cold storage machinery, etc. Permanent directors: B. J. M. Stern and A. Lacey. Secretary: A. Lacey. Regd. office: Park Works, Suffield Street, Middleton, Lancs.

Brodies & Bird, Ltd.—Registered 15th January. Capital, £2,000. To acquire the business of engineers carried on by "Foxwinders," at 74a, East Hill, S.W.18, and to carry on the business of electrical engineers, etc. Permanent directors: R. W. Bird, E. W. Brodie, and L. J. Brodie. Regd. office: 175, Wandsworth High Street, S.W.18.

Par Industries, Ltd.—Registered 13th January. Capital, £10,000. Designers, manufacturers, agents, and dealers in electrical, radio and television apparatus, etc. Directors: W. Partridge, Whin Cottage, Furzefield Road, Beaconsfield, P. King, J. F. Hudson, J. B. Ridley, and C. J. Ellett.

Increases of Capital

C.M.C. (Switchmac), Ltd.—Increased by £250 in £1 shares, beyond the registered capital of £500.

Auto Electric Services (Manchester), Ltd.—Increased by £1,000 in £1 ordinary shares, beyond the registered capital of £1,000.

Receiver Appointed

W. Ratcliffe & Co., Ltd.—W. J. Adamson, Mealhouse Lane, Chorley, Lancs, was appointed receiver and manager on 19th December, under powers contained in £1,000 debenture dated 20th August last.

Bankruptcies

J. Woolcock, Seven Stars, High Street, Robertsbridge, Sussex, wireless and electrical engineer, and lately carrying on business and residing at Iridge Cottage, Hurst Green, Sussex, and also at John Cross, Mountfield, Robertsbridge.—First meeting held 27th January at 8, Old Steine, Brighton, 1. Public examination 1st March at the Town Hall, Hastings.

Liquidations

A. F. Bulgin & Co., Ltd.—Winding up voluntarily for reconstruction purposes. Liquidator, Mr. S. E. Parish, 8, Queen Street, London, E.C.4. (The registration of a new company with the above title is recorded in our "New Companies" section).

Universal Equipment Co. (Manchester), Ltd.—At a recent meeting of creditors a resolution was passed confirming the voluntary liquidation of the company with Mr. A. T. Eaves (Harry L. Price & Co.), as liquidator. A committee of inspection was also appointed.

STOCKS AND SHARES

THE first month of the year has brought a good deal of business to Stock Exchange markets and, also, it produced a fair number of interesting features. The general tendency is affected to some extent by the outlook for gilt-edged securities. British Government stocks are a weak market, although this is not exercising any noticeable influence over the prices of front rank debenture stocks and preference shares in the industrial departments. Vague rumours of a capital levy tend to unsettle security and to lay a restraint upon the investment of the large amounts of money still available for investment. Price fluctuations since the beginning of the year, suggest that investment is as perplexed as ever as to what should be done for the best from the point of view of long-term security. New issues are readily subscribed and prices when dealings start usually command a premium.

British Transport Stock

The gilt-edged market has turned dull on definite indications that 2½ per cent has been officially abandoned as the desirable interest rate on British Government securities, and that the authorities are satisfied for the present with conditions as they are. The new 3 per cent British Transport Stock dropped to 97¼, but is regarded as having made a fairly satisfactory start in view of the magnitude of the operation and the care taken by the authorities to give nothing away in the terms of the issue. There remains little evidence of any large-scale movement of money from Transport Stock into other fields.

Transport Shares

Tillings shares, British Electric Traction stocks and others in the same category, are a centre of activity in the industrial markets. Tillings have risen this month a further 17s. 9d. to 93s. 9d., and B.E.T. deferred no less than 240 points to 1,740, in anticipation of a deal with the British Transport Commission for the sale—by agreement—of the companies' transport interests. From these two companies nothing more concrete has so far appeared than Tillings non-committal announcement regarding joint investigation of the position as a preliminary to the opening of negotiations. Calculations of the possible outcome of a sale have fired speculatve imaginations with spectacular results in terms of share quotations. Under compulsory acquisition, compensation for the services would be based partly on the value of the assets, and partly on loss of prospective business. The latter sum is the least known factor in an obscure equation.

Cable & Wireless

As the time approaches for the arbitration concerned with the purchase price to be paid by the Government for Cable & Wireless, Ltd., interest revives in the possibilities surrounding the ordinary stock, the price of which now stands at 177¼. The tribunal is expected to begin its work in March. The Government has been operating that part of the service which it is taking over, for about a year. The principal term of reference is " net maintainable revenue," and it is around this that the question of price revolves.

Scope for Estimates

Various estimates are advanced as to what the Cable & Wireless combine is likely to receive. Some put the figure sufficiently high to allow the ordinary stock an equivalent of 200 per cent. Other guesses are decidedly less optimistic the present price suggests that expectation is cautiously hopeful. Those with long memories will recall the time when the National Telephone Company was taken over by the Government, and the price of the National Telephone deferred stock was run up and down within a wide margin in accordance with the hopes and fears which alternately prevailed as to what the company would ultimately obtain.

Anglo-American Telegraph Shock

Holders of Anglo-American Telegraph stocks —preferred, deferred and ordinary—have suffered a shock from the company's announcement that it has had to defer consideration of the dividends that would normally have been paid on 1st February, because the Western Union Telegraph Co. has expressed doubts as to its liability for British profits tax. The Western Union Telegraph pays the Anglo-American Telegraph a yearly rental for the lease of the Anglo-American lines, and now proposes to obtain a Court ruling as to its liability to make refunds of the tax. Anglo-American Telegraph preferred stock has long enjoyed a reputation for being a sound investment. If the Western Union should succeed in obtaining a decision in its favour, the margin for dividend payments on the Anglo-American stocks would obviously shrink. On the month, the preferred is 10 down at 120 and the deferred 7, at 20; the market is for the moment almost nominal.

Month's Changes

As the accompanying price-lists show, comparison of present quotations with those of a month ago gives mixed results in the market for electrical shares. Of the leaders, Associated Electrical have dropped 3s. 9d. to 83s. 9d. General Electrics at 92s. 6d., British Insulated at 38s., Automatic Telephone at 65s., and Chloride Electric at 5⅛ have lost between a florin and half-a-crown. On the other hand, Electric Constructions have gained 2s. 6d. to 52s. 6d., Revo 3s. to 36s. 6d., Siemens and Ever Ready 1s. each to 35s. 6d. and 40s. respectively. The 3s. rise in E. K. Cole signalizes the increased

(*Continued on page* 183)

ELECTRICAL INVESTMENTS

Past Month's Price Changes

Company	Est. Comp.*	Last Div.	Middle Price 23 Jan. 1948	Month's Rise or Fall	Yield p.c.
Home Electricity Ordinary					
Bournemouth and Poole	66/8	12½	63/–	..	£ 3 s. 19 d. 4
British Power and Light	37/10	8	36/–	..	4 9 0
City of London	34/4	7	33/–	..	4 4 10
Clyde Valley	46/5	8	44/–	..	3 12 9
County of London	49/5	10	47/6	+	4 4 2
Edmundsons	31/6	6	30/6	..	3 18 8
Elec. Dis. Yorkshire	51/–	9	48/6	..	3 14 3
Elec. Fin. and Securities	67/–	15	62/–	..	4 18 4
Elec. Supply Corporation	50/8	10	48/–	..	4 3 4
Lancs. Light and Power	37/7	7½	36/–	..	4 7 0
Llanelly Elec.	29/1	6	27/6	..	4 7 3
Lond. Assoc. Electric	29/6	6	28/–	..	4 5 9
London Electric	31/4	6	29/6	..	4 1 4
Metropolitan E.S.	48/–	9	46/–	..	3 18 3
Midland Counties	51/5	8	49/6	..	3 4 9
Mid. Elec. Power	47/–	9	44/6	..	4 1 0
Newcastle Elec.	32/7	7	30/–	..	4 13 4
North Eastern Elec.	36/6	7	35/–	..	4 0 0
Northampton	50/11	10	48/6	+6d.	4 2 4
Northmet Power.	48/2	9	46/–	+6d.	3 18 3
Scottish Power	46/1	9	44/–	..	3 18 3
Southern Areas.	24/–	5½	23/–	..	4 15 8
South London	33/–	7	30/6	..	4 11 10
Yorkshire Elec.	50/10	9	48/6	..	3 14 0

Company	Dividend Previous	Dividend Last	Middle Price 23 Jan. 1948	Month's Rise or Fall	Yield p.c.
Public Boards					
Central Electricity:					
1963–93	3½	3½	105½	+2	3 6 4
1974–94	3½	3½	104½	+2½	3 2 2
Overseas Electricity Companies					
Atlas Elec.	Nil	Nil	15/9	+1/3	—
Calcutta Elec.	6†	6†	45/–	–5/–	2 13 4
Cawnpore Elec.	13	13	57/6	–¼	4 10 3
East African Power	7	7	43/–	–1/–	3 5 1
Jerusalem Elec.	5	6	21/3	..	5 12 10
Madras Elec.	8	5	40/6	–1/–	2 9 5
Nigerian Elec.	12½	10	38/9	..	5 3 1
Palestine Elec. "A"	6†	7†	31/9	..	4 8 2
Perak Hydro-elec.	6	7	16/–	..	—
Tokyo Elec. 6%	—	—	57½	–3	—
Victoria Falls Power	19	19½	6¾	..	2 18 0
Whitehall Inv. Pref.	—	6	25/6	..	4 14 1
Equipment and Manufacturing					
Aron Elec. Ord.	10	15	52/6	..	5 14 0
Assoc. Brit. Eng.	12	12	40/–	+5	6 0 0
Assoc. Elec.:					
Ord.	10	15	83/9	–¼	3 11 9
Pref.	8	8	42/6	–1/–	3 15 4
Automatic Tel. & El.	12½	12½	65/–	–2/–	3 17 0
Babcock & Wilcox	12½	15	71/6	–4/3	4 4 0

Company	Dividend Previous	Dividend Last	Middle Price 23 Jan. 1948	Month's Rise or Fall	Yield p.c.
Equipment and Manufacturing (*Continued*)					£ s. d.
Baldwin, H.J. (2/–)	10	20	10/6	+6d.	3 16 3
British Aluminium	8	10	53/6	..	3 14 8
B.I. Callender's	—	6¾	38/–	–2/6	3 10 2
British Rola (2/–)	15	10	4/–	–6d.	5 0 0
British Thermostat (5/–)	18½	23½	26/3	..	4 9 6
British Vac. Cleaner (5/–)	30	20	15/–	–6d.	6 13 4
Brush Ord. (5/–)	4	—	7/–	–6d.	—
Burco (5/–)	20	35	28/3	+¼	6 4 0
Chloride El. Storage	20	20	5½	–½	3 18 2
Christy Bros.	17½	17½	80/–	..	4 7 6
Cole, E. K. (5/–)	20	22½	21/–	+3/–	5 7 2
Cossor, A. C. (5/–)	12½†	25	18/–	–6d.	6 18 10
Crabtree (10/–)	17½	17½	44/6	–1/6	3 18 8
Crompton Parkinson Ord. (5/–)	22½	22½	28/6	–2/–	3 19 0
De La Rue (5/–)	45	50	48/3	–4/3	5 3 9
Decca (1/–)	112½	112½	37/6	–3/9	3 0 0
E.M.I. (10/–)	8	6	19/–	–1/9	3 3 4
Elec. Construction	12½	12½	52/6	+½	4 15 3
Enfield Cable Ord.	12½	7½	38/3	..	3 18 6
English Electric	10	10	55/–	–¼	3 12 9
Ericsson Tel. (5/–)	20†	20†	46/3	+¼	2 3 3
Ever Ready (5/–)	40	40	40/–	+1/–	5 0 0
Falk Stadelmann	10	15	50/–	+½	6 0 0
Ferranti Pref.	7	7	36/6	+1/–	3 16 9
G.E.C.:					
Pref.	6½	6½	36/–	..	3 12 3
Ord.	17½	17½	92/6	–½	3 15 9
General Cables (5/–)	25	50	47/6	..	5 5 4
Greenwood & Batley	15	15	48/9	+½	6 3 0
H.T.A. (10/–)	10	10	16/9	+6d.	5 19 5
Heatrae (2/–)	12½	12½	5/–	..	5 0 0
Henley's (5/–)	20	20	25/–	–1/–	4 0 0
4½% Pref.	4½	4½	25/–	..	3 12 0
Hopkinsons	20	22½	5¾	+¼	4 4 0
Intl. Combustion (5/–)	32½	37½	50/–	–¼	3 15 0
Johnson & Phillips	15	15	75/–	–¼	4 0 0
Lancashire Dynamo	22½	22½	6	..	3 15 0
Laurence, Scott (5/–)	12½	12½	13/–	..	4 16 2
London Elec. Wire	7½	10	46/3	+¼	4 6 6
Mather & Platt	10	11	54/6	–6d.	4 0 9
Metal Industries (B)	9	10	47/6	–¼	4 4 2
Mid. Elec. Mfg.	30	35	8½	–½	4 2 6
Murex	20	20	93/9	–¼	4 5 1
Newman Ind. (2/–)	22½	22½	7/3	..	6 4 5
Plessey (5/–)	30	20	20/–	–2	5 0 0
Parsons C. A.	—	12½	67/6	..	3 14 0
Pye Deferred (5/–)	25	25	26/3	+¼	4 15 3
Radio & Tel. (2/–)	40	—	7/–	..	—
Revo (10/–)	20	27½	56/6	+3/–	4 17 3
Reyrolle	12½	12½	68/9	+6d.	3 12 8
Scophony (5/–)	—	—	4/–	..	—
Siemens Ord.	7½	7½	35/6	+1/–	4 4 6
Strand Elec. (5/–)	12½	17½	12/9	+6d.	6 17 3
Switchgear & Cowans (5/–)	25	10	21/–	+1/–	2 7 9
T.C.C. (10/–)	12½	15	35/–	+¼	4 5 9
T.C. & M.	10	10	51/9	–9d.	3 17 3

* Proposed amount of British Electricity Stock to be allotted.
† Dividends are paid free of Income Tax.

Company	Dividend Previous	Dividend Last	Middle Price 23 Jan. 1948	Month's Rise or Fall	Yield £ s. d.
Equipment and Manufacturing (*Continued*)					
Telephone Mfg.(5/-)	9	9	9/9	−9d.	4 12 4
Thorn Elec. (5/-)	20	25	25/-	+⅛	5 0 0
Tube Investments	22½	25	7⅛	+⅛	3 10 7
Vactric (5/-) ..	Nil	Nil	13/9	+⅛	—
Veritys (5/-) ..	7½	2½	5/6	+6d.	2 5 6
WalsallConduits(4/-)	55	70	52/6	⅛	5 9 4
Ward & Goldstone (5/-)	35	50	61/3	..	4 1 8
Watford (2/-) ..	15	15	6/3	−6d.	4 16 0
WestinghouseBrake	14	14	71/6	−1/-	3 18 3
West, Allen (5/-)	7½	10	11/3	+3d.	4 9 0
Traction and Transport					
Brit.Elec.Traction:					
Def. Ord. ..	45	50	1740	+240	2 17 4
Pref. Ord. ..	8	8	198	+8	4 0 10
Calcutta Trams..	7½	Nil	37/6	−1/-	—
Cape Elec. Trams	5	6	31/-	..	3 17 0
T. Tilling ..	10	10	93/9	+17/9	2 2 9
West Riding ..	10	12	65/-	..	3 13 10

Company	Dividend Previous	Dividend Last	Middle Price 23 Jan. 1948	Month's Rise or Fall	Yield £ s. d.
Telegraph and Telephone					
Anglo-Am. Tel.:					
Pref.	6	6	120	−10	5 0 0
Def.	1½	1½	20	−7	7 10 0
Anglo-Portuguese	8	8	30/-	..	5 6 8
Cable & Wireless:					
5½ Pref. ..	5½	5½	124½	+3	4 8 4
Ord.	4	4	177½	+1½	2 5 1
CanadianMarconi$1	Nil	4 cts.	10/-	..	—
Globe Tel. & Tel.:					
Ord.	8½†	5†	46/9	−2/-	2 2 9
Pref.	6	6	32/-	−6d.	3 15 0
GreatNorthernTel. (£10)	18	15	28½	+1	5 5 3
Inter. Tel. & Tel.	Nil	Nil	20½	+3	—
Marconi-Marine..	7½	7½	32/-	−6d.	4 13 9
Oriental Tel. Ord.	4	10	56/3	+1/9	3 11 2
Telephone Props.	6	6	18/6	..	6 9 9
Tele. Rentals (5/-)	10	10	11/9	−9d.	4 5 1

† Dividends are paid free of Income Tax.

Stocks and Shares (*Continued from page* 181)

dividend, but E.M.I. have shed 1s. 9d., and are now 19s. Midland Electric Manufacturing at 8½, Greenwood & Batley at 48s. 9d., and Telegraph Condensers at 35s. are among the firm spots. Falls in Babcocks and International Combustions illustrate the easier tendency of engineering shares.

Decca Prospects

Decca 1s. ordinary shares are among the most consistently active and volatile performers in the industrial market. Within the past twelve months they have been quoted over £3 and well under 30s. Just before the war, they could have been bought for a few pence. They are now 37s. 6d. and, on the 112½ per cent dividends paid in each of the past three years, yield exactly 3 per cent. For the modesty of the yield and the activity of interest, the commercial possibility of the Decca Navigator system are held by the market to be mainly responsible. Progress in this electronic field was reviewed by Sir Cyril Entwistle at the meeting early this month. He said that during the year contracts were completed for the fitting of over 400 ships, and the system is apparently being adopted by the leading coastal shippers. The system is also finding favour abroad, in international circles, and in the air. What this may mean in terms of profits is reflected in the chairman's estimation that the company is now in sight of tangible returns on the capital and effort expended.

Investor's Choice

Market conditions cannot be said to offer much inducement for the most disgruntled of former railway stockholders to forsake, at this stage of events, their Government-guaranteed 3 per cent security. Among the alternatives, good debentures do practically nothing to improve the yield. Preference shares of the calibre of the recent 4 per cent issues by Siemens, Reyrolle and Murex, all quoted around 23s., return only 3½ per cent. From ordinary shares in the class of G.E.C., A.E.I., Crompton Parkinson or English Electric, the investor sees no more than 3½ to 4 per cent on his money, taking last year's dividends as the basis; although in the case of equities, inflationary factors add weight to those of yield. Higher yields involve, as a rule, more than the usual quota of uncertainties. As a further disincentive, the 2 per cent transfer stamp, on new investment, represents more than eighteen months' net interest, after tax at 9s., on the 3 per cent stock.

Education for Industry

IN October last the British Association for Commercial and Industrial Education held its annual conference at Ashridge, Berkhamsted, at which a number of addresses were given. These have now been issued in book form ("The Short Road to Industrial Co-operation") and can be obtained from the Association, 107, Baker Street, W.1, at 5s. per copy. Mr. George Tomlinson, Minister of Education, has contributed a foreword in which he expresses his appreciation of the value of the Association's work. Discussion groups were formed at the conference and the volume includes précis of their views on the addresses. These are of interest as indicating the opinions of the various parties concerned with the successful operation of industry and commerce—employers, employed and educational authorities.

Next Week's Events

Monday, 2nd February

BIRMINGHAM.—James Watt Memorial Institute, Great Charles Street, 6 p.m. I.E.E. South Midland Centre. "Standardization of Switchgear," by D. E. Lambert and J. Christie.

LEEDS.—Great Northern Hotel, 7.30 p.m. A.S.E.E. Leeds Branch. "Installation and Maintenance in relation to I.E.E. Regulations," by A. Wilde.

LIVERPOOL. — Royal Institution, Colquitt Street, 6.30 p.m. I.E.E. Mersey and North Wales Centre. Report on "The Practical Training of Professional Electrical Engineers," to be presented by F. R. Livock.

LONDON.—At the Institution of Electrical Engineers, Savoy Place, W.C.2, 5 p.m. Institution of Post Office Electrical Engineers. "Modern Approach to Transmission Networks," by Dr. D. G. Tucker and F. Scowen.

NEWCASTLE-ON-TYNE.—King's College, 6.15 p.m. I.E.E. North-Eastern Radio and Measurements Group. "Integrating Metering Review," by C. C. Baxendale.

SHEFFIELD.—Royal Victoria Hotel, 7.30 p.m. A.S.E.E. Sheffield Branch. "Slip Ring Motor Starters," by J. E. Pegg.

Tuesday, 3rd February

CAMBRIDGE.—Cavendish Laboratory, 8.15 p.m. I.E.E. Cambridge Radio Group. "The Cavity Magnetron," by Dr. H. A. H. Boot and Dr. J. T. Randall.

ELTHAM.—Castle Hotel, High Street, 8 p.m. A.S.E.E. South-East London Branch. "Consumer Service," by A. E. Marlow.

LONDON.—Connaught Rooms, W.C.2, 6.30 for 7 p.m. I.E.E. Measurements Section. Social function.

The Oddfellows' Hall, 186, Hammersmith Road, S.W., 7 p.m. A.S.E.E. West London Branch. "Electrical Observations in America," by A. W. Jervis.

MANCHESTER. — Engineers' Club, Albert Square, 6 p.m. I.E.E. North-Western Centre. "Standardization of Switchgear," by D. E. Lambert and J. Christie.

Wednesday, 4th February

BIRMINGHAM.—James Watt Institute, Great Charles Street, 7 p.m. Junior Institution of Engineers (Midland Section). Presidential Address. "Impressions of Power Plant Development in the U.S.A.", by L. F. Jeffrey.

BRIGHTON.—Technical College, 6.30 p.m. I.E.E. Southern Centre. Report on "The Practical Training of Professional Electrical Engineers," to be presented by Brigadier F. T. Chapman.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Radio Section. "The Application of Frequency Modulation to V.H.F. Multi-Channel Radio-telephony," by J. H. H. Merriman and R. W. White.

LONDON.—I.E.E. London Students' Section. Visit to the Micanite & Insulators Co., Ltd., Walthamstow.

MIDDLESBROUGH.—Cleveland Scientific and Technical Institute, 6.30 p.m. I.E.E. Tees-Side Sub-Centre. "Electrical Aspects of Overhead Travelling Cranes," by G. V. Sadler.

NEWCASTLE-ON-TYNE.—King's College, 7 p.m. I.E.E. North-Eastern Students' Section. "The British Grid System," by R. K. Edgley.

NOTTINGHAM.—Gas Showrooms, Parliament Street, 6.30 p.m. Institution of Heating and Ventilating Engineers (East Midlands Branch). "Electrical Energy in the Service of the Heating and Ventilating Engineer," by P. A. Moore.

PRESTON.—Harris Institute, 6.45 p.m. I.E.E. North-Western Centre. Report on "The Practical Training of Professional Electrical Engineers," presented by K. R. Evans.

ROMFORD.—Mawney's Arms, 8 p.m. A.S.E.E. North-East London Branch. "Underground and Overhead Distribution," by L. R. Perkins.

Thursday, 5th February

CARDIFF. — Corporation Demonstration Theatre, 3.30 p.m. Illuminating Engineering Society (Cardiff Centre). "Future Trends of Fluorescent Lighting," by H. L. Tredree.

CROYDON.—Café Royal, 8 p.m. A.S.E.E. South London Branch. "Electrical Contactors and Automatic Control," by S. H. Harding.

LEICESTER.—Electricity Offices, Charles Street, 6.45 p.m. Leicester Electrical Society. "Hot and Cold Fluorescent Lighting," by A. L. Randall.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. Institution of Electrical Engineers. "A Survey of the Telephone Rating Problem," by L. C. Pocock.

Friday, 6th February

BIRMINGHAM.—Grand Hotel, 7 p.m. I.E.E. South Midland Centre. Annual dinner.

BRISTOL.—I.E.E. Bristol Students' Section, 7 p.m. "Design of A.F. Amplifiers," by E. H. Griffiths.

LONDON. — 39, Victoria Street, S.W.1, 6.30 p.m. Junior Institution of Engineers. Informal meeting. "Power Transmission in Diesel Electric Locomotives," by T. Schur.

NEWCASTLE-ON-TYNE.—Mining Institute, 6.15 p.m. North-East Coast Institution of Engineers and Shipbuilders. "Alternating Current for Ships' Auxiliaries," by A. N. Savage.

Saturday, 7th February

BRISTOL.—Merchant Venturers' Technical College, 7 p.m. I.E.E. Bristol Students' Section. Joint dance with students and graduates of the Institution of Mechanical Engineers.

CARDIFF. — Park Hotel. Association of Mining Electrical and Mechanical Engineers (South Wales Branch). Annual dinner.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1944

SPERRY Gyroscope Co., Inc.—"High-frequency electron discharge apparatus." 1818. 3rd February, 1943. (596567.) "Tilt-operated electric-conducting liquid switches." 13847. 19th July, 1943. (596572.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea, D. M. Ambrose and J. K. Beney.—"Generation of electric pulses." 5940. 30th March, 1944. (596638.)

Raytheon Manufacturing Co.—"Electron discharge devices." 8060. 26th November, 1941. (596568.)

C. L. Hughes (D. S. Drabble, E. J. Drabble and P. O. de Zarate).—"Electric water heater." 14351. 27th July, 1944. (596782.)

Standard Telephones & Cables, Ltd.—"Metal dry contact rectifier elements." 14576. 13th July, 1943. (596783.) "Dry rectifier element." 18683. 6th December, 1943. (596786.) "Electric connections to electric discharge tubes and like devices." 22859. 22nd December, 1943. (596647.) "Electron discharge devices." 22860. 22nd December, 1943. (596648.) "Cable joints and method of forming the same." 23258. 8th January, 1943. (596583.)

Autophon Akt.-Ges.—"Multi-station direct-call telephone systems." 18709. 31st December, 1943. (596642.)

F. J. Jenkins.—"Electric hot plates mounted in tables and the like." 19391. 9th October, 1944. (596578.)

F. Okolicsanyi and B. T. Sandor.—"Thermo-electric generator." 19928. 16th October, 1944. (596644.)

English Electric Co., Ltd., and H. Dolan.—"Electric motor control apparatus." 23695. 28th November, 1944. (596584.)

Imperial Chemical Industries, Ltd.—"Electric condensers." 23787. 4th October, 1943. (Cognate applications 23788/44, 23789/44, 23790/44 and 23791/44.) (596791.) "Electric condensers, and vitreous compositions particularly for use therein and electrical insulation." 23793. 4th October, 1943. (596792.)

Westinghouse Electric International Co.—"Selenium rectifiers or light-sensitive devices." 24520. 15th December, 1943. (596585.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea and J. K. Beney.—"Pulse modulation communication systems." 25593. 20th December, 1944. (596654.)

1945

Standard Telephones & Cables, Ltd.—"Radio locating and communicating systems." 561. 8th January, 1944. (Addition to 590701.) (596794.) "Piezo-electric frequency determining unit." 19293. 4th August, 1944. (596503.) "Resonant circuits for panoramic radio receivers." 19540. 7th May, 1943. (596617.)

W. R. Hewlett and D. Packard (trading as Hewlett-Packard Co.).—"Electric arc welding system." 3226. 17th December, 1943. (596797.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea, C. T. Scully, D. M. Ambrose and J. K. Beney.—"Pulse modulation communication systems." 5185. 1st March, 1945. (596658.)

G. L. R. Jones and F. Lloyd-Kessel.—"Electrically driven appliances." 5375. 3rd March, 1945. (596659.)

Submarine Signal Co.—"Voltage regulators." 6871. 12th June, 1942. (596596.)

British Thomson-Houston Co., Ltd., J. T. Anderson, H. F. Ward and R. S. Wells.—"Luminescent material incorporating magnesium tungstate." 7020. 20th March, 1945. (596597.)

Maschinenfabrik Oerlikon.—"System comprising a plurality of rotor-fed three-phase current shunt commutator motors." 7178. 4th April, 1944. (596665.)

F. C. Williams.—"Time base circuit arrangements." 8134. 30th March, 1945. (596803.)

English Electric Co., Ltd., and G. R. Wilson.—"Ward Leonard system of electric motor control." 9832. 19th April, 1945. (596671.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea and D. M. Ambrose.—"Electric pulse signalling systems." 11987. 12th May, 1945. (596676.)

L. H. Pearson.—"Electric blankets and the like." 11993. 14th May, 1945. (596810.)

Standard Telephones & Cables, Ltd. (International Standard Electric Corporation).—"Systems for changing electric accumulators supplying an intermittent load." 12600. 18th May, 1945. (596679.)

N. Pensabene.—"Dynamo electric machines." 12821. 23rd May, 1945. (Addition to 490062.) (596604.)

Standard Telephones & Cables, Ltd., and M. L. Gayford.—"Electrical sound reproducing and/or recording devices." 14021. 4th June, 1945. (596812.)

Westinghouse Electric International Co.—"Control systems for direct-current motors." 14789. 27th June, 1944. (596607.) "Electronic means for controlling load circuits for welding and other apparatus." 19993. 15th August, 1944. (596832.)

Igranic Electric Co., Ltd.—" Electrical contacts." 15572. 23rd June, 1944. (596686.)

Mallory Metallurgical Products, Ltd., and N. A. Tucker.—" Resistance welding apparatus." 18914/5. 5th February, 1945. (Cognate application 18916/7/45.) (Divided out of 574495.) (596823/4.) " Resistance welding apparatus." 18918. 12th March, 1945. (Divided out of 579527.) (596825.)

English Electric Co., Ltd., J. B. Young and A. J. Riches.—" Operation and control of polyphase induction motors driving a common load." 19291. 27th July, 1945. (596502.)

Marconi's Wireless Telegraph Co., Ltd.—" Detector circuits for angle-modulated oscillations." 19347. 28th July, 1944. (596519.) " Amplifying circuits for angle modulated waves." 19392. 29th July, 1944. (596531.)

Burgess Battery Co.—" Electric dry batteries." 19362. 20th September, 1944. (596523.)

J. A. Crabtree & Co., Ltd., and R. W. Morgan.—" Shuttered electric switch sockets." 19364. 28th July, 1945. (596524.)

G. Ingham.—" Safety device for electrically-driven machines." 19373. 28th July, 1945. (596526.)

W. J. Fraser & Co., Ltd., and M. B. Donald.—" Electric heaters for organic liquids." 19385. 30th July, 1945. (596529.)

Skylux, Ltd., and E. G. A. Gill.—" Machine for use in boring underground, and for positioning underground service-pipes, conduits, cables and the like." 19457. 30th July, 1945. (596545.)

Partridge Wilson & Co., Ltd., and H. G. A. R. Wilson.—" Means for mounting electrical and other apparatus and other bodies on walls or like supports." 19458. 30th July, 1945. (596546.)

Metropolitan-Vickers Electrical Co., Ltd., and G. R. Higgs.—" Electric power transmission systems for mobile power plant." 19480. 30th July, 1945. (596552.)

English Electric Co., Ltd., and A. T. Chadwick.—" Laminated magnetic cores." 19515. 30th July, 1945. (596556.)

Standard Telephones & Cables, Ltd., R. M. Barnard and J. Paine.—" Electric condensers." 19594. 31st July, 1945. (596625.)

Westinghouse Brake & Signal Co., Ltd., R. G. Sell and L. E. Thompson.—" Alternating electric current rectifiers of the dry surface contact type." 19614. 31st July, 1945. (596629.)

Siemens Bros. & Co., Ltd., E. A. Bryan and W. B. Jackson.—" Electro-magnetic relays." 19615. 31st July, 1945. (596630.)

Soc. Anon. des Manufactures des Glaces et Produits Chimiques de Saint-Gobain, Chauny & Cirey.—" Transformer for variable voltage." 19685. 21st April, 1944. (596830.)

J. B. Tucker.—" Electric tumbler switches particularly for alternating current." 19724. 1st August, 1945. (596721.)

E. G. Budd Manufacturing Co.—" Systems for supplying uni-directional current from an alternating current source particularly for arc welding." 19763. 15th July, 1944. (596726.)

General Electric Co., Ltd., and W. G. Thompson.—" Vacuum seals for vapour electric arc convertors." 19779. 1st August, 1945. (596730.)

Elliott Bros. (London), Ltd., and H. S. Petch.—" Means for indicating whether electric conductors are connected to or disconnected from a source of supply." 19799. 1st August, 1945. (596733.)

Metropolitan-Vickers Electrical Co., Ltd., and J. Fowler.—" Quick-motion mechanisms normally operated by stored energy, for example, for on-load tap changing of electric transformers and the like." 19821. 1st August, 1945. (596737.) " Means for operating the diverter switches of on-load tap changers of electric transformers." 19822. 1st August, 1945. (596738.)

Liverpool Electric Cable Co., Ltd., and J. T. Frost.—" Wire stranding and machines therefor." 19861. 2nd August, 1945. (596746.)

Siemens Bros. & Co., Ltd., and D. P. Long.—" Automatic telephone systems." 19890. 2nd August, 1945. (596752.)

Horstmann, Ltd., and S. A. Horstmann.—" Electrically driven hair clippers and the like." 19897. 2nd August, 1945. (596754.)

British Thomson-Houston Co., Ltd.—" Electron tubes." 19933. 10th August, 1944. (596764.) " Apparatus for coating filaments or the like." 19954. 10th August, 1944. (596767.)

Telegraph Condenser Co., Ltd., P. A. Sporing and N. H. Bentley.—" Electric terminals." 20425. 9th August, 1945. (596835.)

English Electric Co., Ltd., J. B. Young and A. J. Riches.—" Operation and control of polyphase induction motors driving a common load." 22412. 27th July, 1945. (Divided out of 596502.) (596565.)

Telegraph Condenser Co., Ltd., and K. S. Oliver.—" Electrolytic capacitors." 26871. 15th October, 1945. (596839.)

Standard Telephones & Cables, Ltd., C. W. Earp and M. M. Levy.—" Arrangements for generating electric pulses." 31332. 21st November, 1945. (596699.)

Telegraph Condenser Co., Ltd., P. A. Sporing and J. W. Purse.—" Manipulation of wire." 31495. 22nd November, 1945. (596840.)

Standard Telephones & Cables, Ltd., and M. M. Levy.—" Two-way electric pulse communication systems." 35317. 31st December, 1945. (596700.)

1946

Mallory Metallurgical Products, Ltd., and N. A. Tucker.—" Resistance welding apparatus." 7464/5/6. 11th March, 1946. (596843/4/5.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea, D. M. Ambrose and J. K. Beney.—" Generation of electric pulses." 33983. 30th March, 1944. (Divided out of 596638.) (596702.)

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Acton. — 4th February. Corporation. Erection and assembly of concrete lamp posts and equipment. (23rd January.)

Andover.—23rd February. Borough Council. Eight vertical spindle electrically operated centrifugal pumps, with automatic equipment. Borough engineer, Beech Hurst, Weyhill Road.

Belfast.—20th February. Electricity Department. Electrical materials. (See this issue.)

Birkenhead.—17th February. Electricity Department. Electric lamps for year commencing 1st April next. (See this issue.)

Cheadle and Gatley.—16th February. Electricity Department. Cables, lamps, meters, and street lighting standards and fittings for the year ending 31st March, 1949. (23rd January.)

East Lothian.—6th February. County Council. Electrical work at houses (52), Cuthill, Prestonpans. Contractors' names to county architect, County Buildings, Haddington.

Gainsborough.—2nd February. Electricity Department. One 500-kVA and one 250-kVA outdoor type transformers. (23rd January.)

Glasgow.—24th February. Public Health Department. Four electric vehicles. (See this issue.)

Huyton-with-Roby.—16th February. Urban District Council. Electric cables and flexes, lamps, and sundries for one year from 1st April. Surveyor, Council Offices.

Isle of Wight.—7th February. County Council. Applications are invited for permission to tender for heating, hot and cold water and fire-fighting services and electrical services at the County College, Newport, I.W. (See this issue.)

Kent.—14th February. County Council. Applications are invited from firms for inclusion in the Council's approved list of contractors for electrical and engineering works. (23rd January.)

Mitcham.—10th February. Town Council. Electric lamps for one year from 1st April. Borough engineer, Town Hall.

Northampton.—Rural District Council. 25th February. Electric wiring of 37 permanent houses.—R. J. Miller, Council's architect, 1, Cheyne Walk, Northampton.

Plymouth.—28th February. Electricity Department. Electric motors for generating auxiliaries. (23rd January.)

28th February. Five-ton hand-operated overhead travelling crane. (See this issue.)

Poole.—18th February. Town Council. Electric cables, lamps, etc., for one year from 1st April. Borough engineer, Municipal Buildings.

Southampton.—17th February. Domestic appliances for the year ending 31st March, 1949. (See this issue.)

Orders Placed

Norfolk.—County Council. Accepted. Electrical installation work at Hill House, Norwich (£173).—Beaven & Sons.

Swansea.—Electricity Committee. Recommended. Twelve 750-kVA outdoor type transformers (£1,135 each).—Hackbridge & Hewittic Electric Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors. It must be borne in mind that many of the projects mentioned may be postponed as a result of the Government's suspension of building activities for the time being.

Basingstoke.—Extensions to works for Percy E. Fisher (1928), Ltd., Kingsclere; Wallis Gilbert & Partners, 5, Cromwell Road, S.W.7.

Birkenhead. — New Christchurch School, Borough Road; L. Barnish, 58, Rodney Street, Liverpool.

Boldon.—Houses (132) at Cleadon Lane, Whitburn; U.D.C. surveyor.

Bournemouth.—Completion of buildings at Linford Sanatorium (£140,000); borough architect, Town Hall.

Bristol.—Offices for Bristol Industries, Ltd., Mitchell Lane; A. E. Powell, 9, Berkeley Square.

Caernarvon.—Central omnibus station, Slate Quay; borough surveyor.

Cheshire.—Schools in 17 areas (£900,000); E. M. Parkes, county architect, The Castle, Chester.

Dagenham.—Factory, Ripple Road; S. & L. Deyong, Ltd., 31, Houndsditch, E.C.3.

Droitwich.—Police houses, Hindlip, and alterations to Hindlip Hall for new police headquarters; L. C. Lomas, county architect, 60, The Tything, Worcester.

Durham.—Houses (116), Merry Oaks estate; H. E. Pitt, Ltd., builders, Millfield, Sunderland.

Flats at Oswald Court; city engineer.

Houses (28) for officers at Durham Prison; Ministry of Works, London.

Enfield.—New offices; Sterling Textile Industries, Ltd., Alexandra Road, Ponders End.

Extensions to works, Great Cambridge Road; Artofex Engineering Works, Ltd.

Felixstowe.—Junior school, Maidstone Road (£60,000); county architect, Burlington Road, Ipswich.

Glasgow.—Seven prefabricated schools for Corporation; city architect.

Proposed municipal crematorium; city architect.

Grantham.—Houses (120), near Belton Lane; borough engineer, the Guildhall.

Halifax.—County secondary school, Exley (£130,000); borough surveyor, Crossley Street.

Harworth.—Factory, off Bawtry and Scrooby Roads; Black Bros., Ltd., lace manufacturers, Stoney Street, Nottingham.

Heighington.—Houses (30) surveyor, R.D.C. Offices, Darlington.

Hexham (Northumberland).—Remodelling of Westwood Foot Farm to include buildings and electrical equipment; W. Dixon & Son, 1 Collingwood Street, Newcastle-on-Tyne.

Hull.—Reinstatement of Wilson Wing at Royal Infirmary as Radiotherapy Department; Gelder & Kitchen, 120, Alfred Gelder Street.

Shop and showroom premises, Ferensway and Hill Street; S. Simmerman, 9, Hull Road, Cottenham, Yorks.

Lanarkshire.—Factory for MacLean & Co. (Metal Windows), Ltd., 145, Bath Street, Glasgow; Scottish Industrial Estates, Ltd., 3, Woodside Place, Glasgow, C.3.

School at Rutherglen (£56,448); county architect, Lanarkshire House, Glasgow.

Ledbury.—Factory and offices for Alexander Robb & Co., Ltd.; Webb & Gray, High Street, Dudley.

Leith.—New flour mills at Docks; Scottish Co-operative Wholesale Society, Ltd., 95, Morriston Street, Glasgow, C.5.

Lincoln.—Extensions to Technical College; city engineer, Silver Street.

London.—CLERKENWELL.—Extensions to factory premises, 235-245, Goswell Road; North & Partners, Queen Street Chambers, Maidenhead.

CHISWICK.—Extensions to works for Bestall Food Products, Ltd.; Wellesley Road; Wm. Morley, 117, Dalling Road, W.6.

HOXTON.—Rebuilding factory premises, Britannia Walk and Ebenezer Street; Welch & Lander, 38, Gloucester Place, W.1.

MAIDA VALE.—Five-storey extension to Hospital for Nervous Diseases; Young & Hall, 9, Southampton Row, W.C.1.

PECKHAM.—Block of 52 flats, Nigel Road and Peckham Rye; Co-operative Planning, Ltd., 73b, South Side, Clapham Common, S.W.4.

Middlesbrough.—Houses (64), Thorntree estate; borough engineer.

New Malden.—Rebuilding Sacred Heart School, Burlington Road; Adrian G. Scott, 3, Field Court, Gray's Inn, W.C.1.

Northallerton.—Houses (126); R.D.C. surveyor.

Northwood.—College buildings, Green Lane, for London College of Divinity; R. Fielding Dodd, Best & Stevens, 21, Turl Street, Oxford.

Norwich.—Rebuilding factory premises of A. J. Caley & Co., Ltd., Chapel Fields; Frederick S. Snow & Partners, Manor Buildings, Wellington Street, W.C.2.

Nottingham.—Omnibus garage, Beechdale Road, Bilborough (£67,350); borough engineer, Guildhall.

Nuneaton.—Permanent houses (100), Caldwell estate; borough engineer, Coton Road.

Peterborough.—Extensions to works; British Braids, Ltd., Regal Works, Burton Street.

Plaistow.—Extensions to laboratories; Murray & Jones, Ltd., paint manufacturers, Meredith Street.

Rayleigh (Essex).—Factory premises, Arterial Road; F. H. Marshall & Co., Ltd., Lansdowne Drive, Hackney, E.8.

Rotherham.—Central omnibus station; borough engineer, Municipal Buildings.

Rugby.—Additional buildings at Hospital of St. Cross; Loveday & Davis, 2a, Lawrence Sheriffe Street.

Salford.—Reconstruction of war-damaged portion of Town Hall (£29,972); Moston Brick & Building Co., Manchester.

Scarborough.—Rebuilding premises in Roscoe Street for Deardens, Ltd.; Alderson & Allen, architects, 32, St. Nicholas Street,

Stockport.—Works canteen, Gorsey Mount Street; Rhodes, Brydon & Youatt, Ltd., Waterloo Road.

Sunderland.—Additions to the Wear Glass Works for J. A. Jobling & Co., Ltd.; Trussed Concrete Steel Co., Ltd., contractors, London, S.W.5.

Surbiton.—Factory, Alpha Road; A.B.C.D. (Raynes Park), Ltd., 37, West Barnes Lane, S.W.19.

Wakefield.—New factory; Wakefield Shirt Co., Ltd., Horbury Road.

Wallington.—Block of 24 flats, Plough Lane; L. Draper, 4, Pooles Park, Finsbury Park, N.4.

Wallsend.—Extensions to works of Brown & Hood, Carville; Bewley & Scott, builders, Dunston-on-Tyne.

Walsall.—Extensions to works, Bradford Lane; Elijah Jeffries & Sons, Ltd., 32, Montraeth Street.

Wantage.—Agricultural houses (58); R.D.C. surveyor, Council Offices.

Warrington.—Factory premises, Thelwell; Sankey Green Wire Weaving Co., Bellhouse Lane, Grappenhall.